

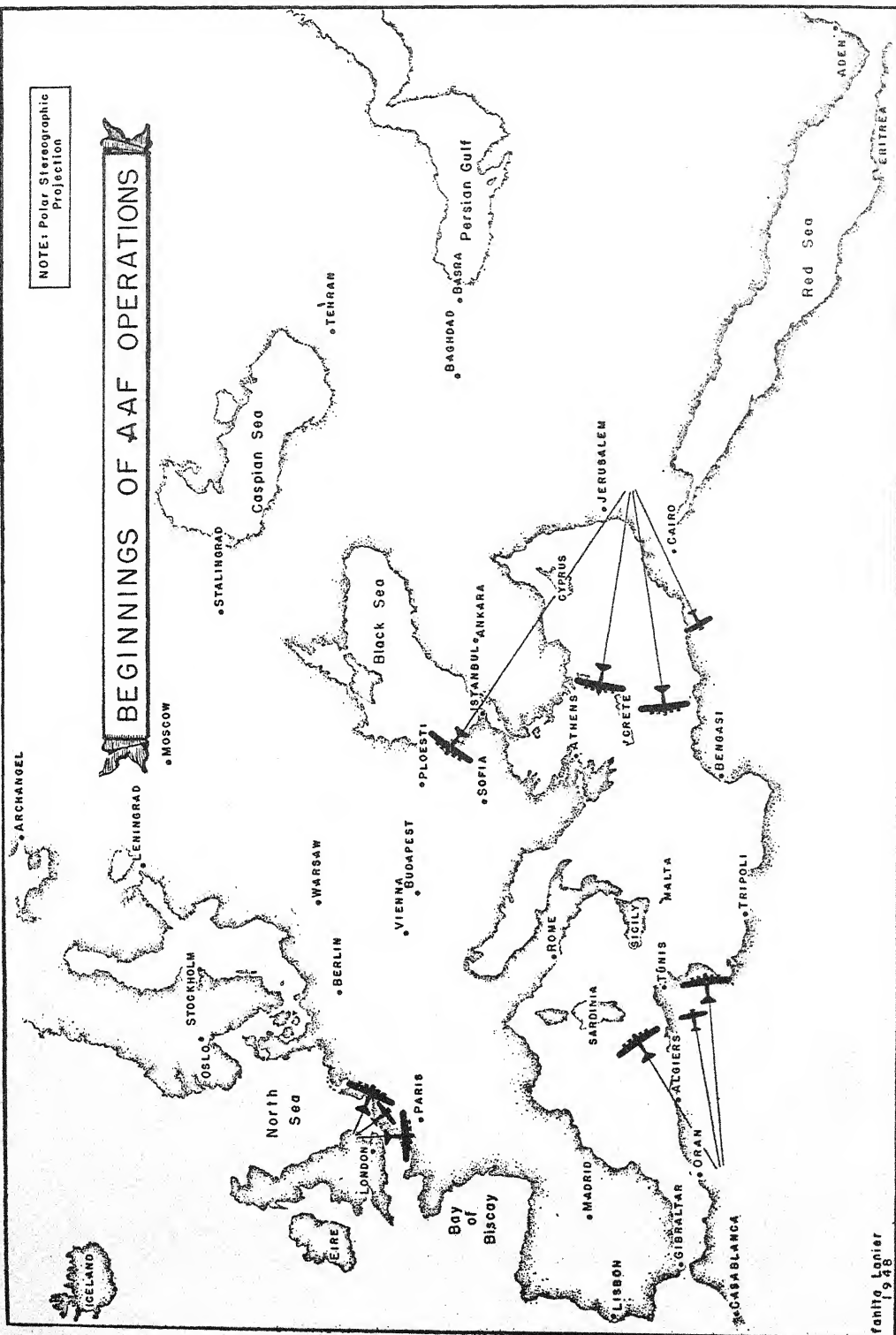


THE ARMY AIR FORCES  
IN WORLD WAR II



NOTE: Polar Stereographic  
Projection

# BEGINNINGS OFAAF OPERATIONS





# THE ARMY AIR FORCES In World War II

*Volume Two*

EUROPE: TORCH TO POINTBLANK

AUGUST 1942 TO DECEMBER 1943

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THE UNIVERSITY OF CHICAGO PRESS



THE UNIVERSITY OF CHICAGO PRESS, CHICAGO 37  
The University of Toronto Press, Toronto 5, Canada

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*Published 1949. Second Impression 1956. Composed and printed by*  
THE UNIVERSITY OF CHICAGO PRESS, Chicago, Illinois, U.S.A.

## FOREWORD

\* \* \* \* \*

THIS volume is the second of seven planned for *The Army Air Forces in World War II*. Elsewhere\* the editors have taxed the patience of the reader by describing in some detail the underlying concepts and the general design of this AAF history; here they have thought it sufficient to set the present volume into the context of the whole work. As the subtitle (*Europe: TORCH to POINT-BLANK* [August 1942 to December 1943]) suggests, Volume II deals with the American air effort against Germany and Italy, a story which will be completed in Volume III. The chronological limits of the present volume, indicated by the operational code names and in the more familiar reckoning of the Christian calendar, were arbitrarily chosen. But they are not without their own logic.

In Volume I, the authors showed that plans and preparations made by the U.S. armed forces before Pearl Harbor for the war which then seemed imminent had been oriented toward Europe; defensive strategy in the Pacific, offensive strategy against Germany, had seemed to offer greatest hope for eventual victory in a global war against Axis powers formally linked in the Tripartite Pact of 27 September 1940. The proposed mission of AAF heavy bombers against the two major enemies was suggestive of the general pattern of thought: in the Pacific a few groups of B-17's were to be used in an effort to impede Japanese expansion toward the south; in Europe many groups were to swell current RAF efforts to crush German war power by strategic bombing in what was planned as the initial offensive effort of the U.S. forces.

These plans had been sharply warped by the astounding string of Japanese victories which began at Pearl Harbor. Anglo-American strategists had stood firm on their over-all concept of the war, but immediate needs in the Pacific had focused Allied attention on that

\* Vol. I, pp. vii-xxii.

area. For several months the Pacific had enjoyed a higher priority in the intertheater competition for the limited resources available than had previously been contemplated. By summer of 1942 this diversion of men and materiel—especially heavy in naval and air categories—had begun to bring results. The Japanese had been abruptly checked; their defeat at Midway was a turning point in the war, a fact apparently recognized at the time by some of their leaders. In early August the invasion of Guadalcanal by American forces had opened a period of local and limited offensives designed to provide bases from which more substantial efforts could be launched as forces became available.

The unexpectedly heavy demand for AAF resources in the Pacific had been complicated by threats to the Middle East. The British especially were alarmed lest German and Japanese advances allow the Axis to join forces somewhere east of the Red Sea and thus disrupt communications vital to the Empire, and had pressed the Americans to reinforce the RAF in Egypt with AAF units.

Under these conditions it had been impossible to put into effect earlier plans for the air offensive against *Festung Europa*; U.S. operations against Germany were limited to desperate efforts to check the U-boat campaign. The Combined Chiefs of Staff had committed Allied forces to an invasion of the continent from England—in September 1942 or spring 1943—however, and the AAF had begun the build-up of forces in the United Kingdom, while extending such aid as they might to the hard pressed British in Egypt. Plans for the offensive in western Europe had remained fluid in the face of Axis successes on the Russian front and in North Africa until the project was indefinitely postponed (in summer 1942) in favor of a grand invasion of Northwest Africa. It was thus against a background of strategic uncertainty that the AAF flew its first bombardment missions into Europe—against Ploesti from Egypt on 12 June, against Rouen from England on 17 August. And so in Europe, as in the Pacific, the summer of 1942 marked a new phase in the war: with those two missions began the AAF's offensive war against Germany, and with them begins this volume.

The organization of the volume reflects in its first four sections the geographical separation between the European and Mediterranean theaters symbolized by those initial missions. Sections I and II deal with the war in the Mediterranean, with the first coming to a natural conclusion in May 1943 as the Allies rounded up the last PW's in Cap Bon and stood poised for their northward spring toward Sicily. Section III

ends less decisively with the Allies temporarily stalled in their drive up the Italian peninsula.

Sections II and IV are concerned with the AAF's campaign of strategic bombardment against occupied Europe and Germany, the break coming, at a time conveniently near the Axis surrender in Tunisia, with the adoption of the Combined Bomber Offensive plan. During the earlier of those periods AAF operations from England were tentative in nature as the heavy bomber formations felt out German defenses and were attenuated in weight as the Mediterranean siphoned off much of the air strength previously allocated to the Eighth Air Force in the United Kingdom. Indeed, the fundamental tactical assumptions of the Eighth were brusquely challenged at the Casablanca conference (January 1943), and it was months after that crisis had been weathered before the promised build-up of forces had begun which was to make the CBO possible. The story of that build-up and of an ever accelerating air attack on Germany itself comes in Section IV which, like Section III, closes with the anticlimax of a December lull in air activities. By that time the imbalance of AAF deployments which had previously favored the Mediterranean had been wiped out, then reversed, and in the United Kingdom the Eighth Air Force was impatiently awaiting a favorable turn in the weather before launching its most telling blows. Friendly critics seem to have sensed something of the pulp magazine serial technique in the suspense in which the reader was left at the end of Volume I, and the editors must offer apology for again breaking off at so crucial a moment; but they are not above hoping that the reader may share vicariously something of the Eighth's impatience.

The volume follows then, with some hazard to its unity, the parallel stories of two campaigns widely separated in space but intimately connected in highest strategy and in their competing demands for resources. By the end of 1943 the distance between the active air fronts had been materially lessened and the essential unity of the two theaters—long a favorite maxim with AAF leaders—had become more obvious. The authors have attempted throughout to emphasize the interdependence of the two theaters, and in Section V they have brought together in a single chapter significant organizational changes in the MTO and ETO which presaged the grand invasions of 1944 and which coordinated more closely the efforts of heavy bombers based in East Anglia and in eastern Italy.

The threat to unity inherent in the dual organization of the volume is

accentuated by a sharp contrast in the nature of air operations in the two areas. In their campaigns in North Africa, Sicily, and Italy the Allies were possessed of a Strategic Air Force built around AAF heavy bombers. But their use of the term "strategic," and indeed of the bombers, bore little resemblance to current practice in the north. The Northwest African Strategic Air Force, like the Tactical Air Force, was used almost exclusively in support of (or "in cooperation with"—significantly enough, the AAF's ban on the former expression and approval of the latter grew out of experiences in the Mediterranean) ground and naval forces. That support (or cooperation) might be very close indeed as a squadron of fighters hovered protectingly over an armored column or as light bombers struck at a bomb line dangerously near an advancing infantry battalion. Or support (cooperation) might entail far-reaching strikes by medium and heavy bombers at shipping in the Mediterranean or at military installations in Sicily, Sardinia, or Italy. But in either case the function of air power was to aid in the defeat of an enemy's armed forces and in the occupation of his soil, and hence the story of the AAF is tied closely to the story of ground—and naval—operations. The few cases in which the strategic force was utilized in operations of the sort typical with the Eighth Air Force merely emphasize, by their rarity, the truth of this generalization. The happy circumstance that between El Alamein and Salerno army air and ground forces were finally welded into an effective team is in itself a clinching argument against attempting to divorce the narratives of air and of ground warfare. Similarly, it would be difficult (and often impossible) to distinguish wholly between the activities of the AAF and the RAF in those instances in which their units were amalgamated into a single striking force.

The story of the AAF in the Mediterranean thus takes on a rhythmic pattern imposed by the successive phases of the combined campaigns in the desert, in Northwest Africa, in Sicily, and in Italy. In each case there is a certain sense of movement, of definite accomplishment marked by the enemy's retreat or surrender and by the gaining of a land mass. Each phase has its beginning, middle, and end; and though the separate phases have in the air no such distinct pauses as come on the ground, the air historian still may follow here a narrative form which is as old as Thucydides.

In the ETO, during the period covered in this volume, AAF units were engaged exclusively in strategic bombardment as that term was

conventionally defined in American doctrine. Their aim was not to aid immediately a ground army; there were no Allied armies on western European soil, and the concept of the bomber offensive as a sort of second front to relieve pressure on the Red Army was an argument after the fact rather than an initiating motive. The true mission of the Eighth Air Force was to weaken Germany by hitting directly at its war potential—industrial, military, and moral—although this required the previous destruction of German air power. The nature of the bombardment campaign imposes on the historian a problem of presentation as novel as was that concept of war.

The heavy bomber offensive was an impersonal sort of war and monotonous in its own peculiar way. Day after day, as weather and equipment permitted, B-17's and B-24's went out, dropped their deadly load, and turned homeward. The immediate results of their strikes could be photographed and assessed by intelligence officers in categories reminiscent of high school "grades"—bombing was excellent, good, fair, or poor. But rarely was a single mission or series of missions decisive; whatever earlier theory had taught of sudden paralysis of a nation by strategic bombardment, in actual practice the forces available were in 1942-43 inadequate for such Douhet-like tactics. The effects of the bombing were gradual, cumulative, and during the course of the campaign rarely measurable with any degree of assurance. Thus there was little visible progress, such as Allied troops could sense as they pushed Rommel's forces back from El Alamein toward Cap Bon, to encourage the Eighth Air Force. Bomber crews went back time and again to hit targets which they had seemingly demolished before. Only near the end of the war when the bottom dropped out of the German defense did the full results of the Combined Bomber Offensive become apparent; before that the "phases" of the long-drawn-out campaign seldom achieved the sharp focus they had shown in the early plans. Drama hovered close to each plane which sortied (as the American public was never allowed to forget), but as drama the big show itself was in 1942-43 flat, repetitive, without climax. The bomber crew found its sense of accomplishment in the twenty-fifth mission, which, in theory, would bring rotation and relief, not in an island won, an enemy army's surrender.

Such being the nature of the war, it would not be profitable to chronicle each of the 171 missions staged by the Eighth Air Force in the period here under consideration—certainly not in the detail made



possible by the richly informative mission reports which constitute the basic sources for the operational narrative.\* A few missions stood out because of the size of the force dispatched (as Ludwigshafen, 30 December 1943), or because of ferocious defense (as Schweinfurt, 14 October), or because of brilliant bombing (as Marienburg, 9 October). For a mother who lost a boy in the Eighth's 121st mission, that operation was uniquely and tragically important, but for a more detached reader (as for many of the participants) it was pretty much like another. And hence in his effort to give meaning to the operational story the historian must often reduce to statistical summaries the details of many an air battle; figures on sorties and tons dropped and claims registered supplant blood and anguish and heroism. This method is not without its weakness, since the deliberate suppression of derring-do from the narrative may tend to obliterate the human element which is basic to all combat. But the method has this additional justification, that it seems more appropriate than a dramatic style to the matter-of-fact spirit of the boys who flew the missions and to the studied calculations of those leaders who dispatched them.

The authors have adopted in general the point of view (in the sense of perspective rather than of bias) of the AAF commanders and their staffs. Often their estimates of the enemy situation were wrong and their evaluations of damage inflicted were exaggerated; but it was upon such incomplete intelligence that the war was fought, and the frequent critiques and corrections imposed upon the narrative by the authors are essentially parenthetical. This point of view explains in some degree the manner in which enemy sources have been used in this volume.

The fortunes of war have put at the disposal of Allied historians a vast fund of official records of the European Axis powers. According to agreements made by the Combined Chiefs of Staff, the United States kept the ground force files, Great Britain those dealing with the enemy air forces. After the collapse of Italy the Germans gutted the archives of the Italian Air Force so thoroughly that part of the story in the Mediterranean can never be fully documented. But in the swift debacle of May 1945 the Luftwaffe records fell almost intact into Allied hands. Since then the historical section of the British Air Ministry has been engaged in processing those records for more convenient use, but because they have proceeded in chronological sequence the

\* A list of the missions, with a brief summary of the most important data, is provided below on pp. 841-52 for ready reference.

readily available materials deal as yet with the period before Pearl Harbor. Nevertheless the Air Ministry and the RAF have done all within their power to make available to the U.S. Air Historical Group Luftwaffe documents of the later period. Two of the present authors, Mr. Simpson and Mr. Goldberg, went to London to pursue investigations for themselves and for the other historians concerned. For the rest the authors have called on the Air Ministry for copies of needed documents and for spot research on specific problems. From their own experiences in the Air Historical Group both authors and editors of this volume realize how such requests intrude upon current duties, and they render thanks here, as they have done before, to Mr. J. C. Nerney and his staff for material help graciously given.

The authors have found most valuable those German reports which deal with enemy policy or which consolidate detailed information from the lower echelons. Practical considerations of time, to be sure, have inclined them to lean most heavily upon Allied sources and the generalized Axis reports, to the exclusion of diaries or journals of the lesser units of the Luftwaffe, for the operational story; it would require years of research for the authors to sift the German records as thoroughly as they have our own. But the deciding argument against attempting to follow each day's operations in the detailed enemy sources has been that the nature of the air war makes that a process of rapidly diminishing returns.

Even by infinite pains it would be impracticable to compile a day-by-day account of air operations by a comparative analysis of U.S. and enemy reports, as one might do for ground armies locked in an extended battle. The air war was continuous but in a real sense transient. On the ground, corps faced corps, division faced division for days, sometimes for weeks. In the air on successive days the aircraft engaged were drawn from different units; in the AAF's bomber offensive the planes were formed into a one-day task force which would never again be duplicated, and on the defensive each day's effort was supplied by such German fighters as were available. It was especially true in the ETO that the air war was between rival air forces, not between mutually opposed groups or squadrons, and this fact tends to depreciate the immediate value of the detailed unit record.

As for the details of the actual air battle, the information, whether from American or German sources, is rarely as exact as the historian could wish. That fault, too, stems from the very nature of aerial combat.

A nineteen-year-old boy takes off in a "hot" plane, alone or with a crew, in accordance with a plan to bomb or strafe a specified target at a desired time; he must fly from his base, often at great distance from the target, through weather which frequently makes precise navigation difficult and through opposition from fighters whose passes are incredibly swift; he arrives over the target at as nearly the set minute as possible and performs his deadly task under circumstances which rarely permit him to take time out for the sort of entry so familiar in the ship's log. Even without the emotional strain of the battle, the boy would find it impossible on his return to give to his interrogating officer an accurate and detailed report of his own experiences, and the story of a large mission must be compounded of hundreds of such imperfect individual reports. So it is that the historian though literally swamped by the mass of his sources may raise for any mission questions as difficult to solve as if they dealt with the Battle of Hastings or Custer's Last Stand.

A case in point is the simple problem of checking AAF claims of losses inflicted on the enemy air forces. Eighth Air Force leaders, recognizing by autumn 1942 that accepted claims of German fighters destroyed or damaged by heavy bomber crews were too optimistic, made repeated efforts to scale down previous statistics and to correct procedures for reporting. As a check against the validity of the adjusted figures, the records of the General Quartermaster's Department of the German Air Ministry have been consulted for the present volume. These are based upon requisitions for replacement of planes lost or damaged, a type of information far more reliable by its very nature than battle claims, as can be shown by comparable AAF reports. It is true that these records can provide only an approximate figure for comparison with claims entered by Eighth Air Force crews. The form of the German documents in question is such that it shows for a given day the total number of GAF fighters lost to "enemy action" and of those lost for causes not attributed to "enemy action." It is possible to determine total losses in western Germany but not always to distinguish sharply between losses which should be credited to the AAF and to the RAF. But the German records seem to constitute a reliable outside maximum for AAF aerial victories, and, utilized for that purpose, they have proved invaluable.

Unfortunately those records became available only after the present study was nearing completion. Considerations of time and the present state of the records have forced upon the editors acceptance for the purposes of this volume of an imperfect spot check on a number of key

air battles. The results of this sampling have been so startling that the editors have been torn between regret at the tardiness of the discovery and relief that it was made before the book went to press. For the sampling has indicated that Eighth Air Force claims were far more exaggerated than even their severest critics had assumed. Indeed, the preliminary results of the investigations raise questions so fundamental to this history—and to evaluation procedures of the AAF itself—as to require closer study of the whole problem than can be made at this time. Rather than delay indefinitely the publication of the present volume, the editors have chosen to go to press with a study frankly written, as they have suggested above, from the point of view of the AAF records but with the disparity between those and enemy records noted. It is the sort of decision which all too often faces the historian working with contemporary materials, when any day may bring forth fresh evidence. The editors hope, however, that a wider use of the pertinent German documents can be made for the succeeding volume on the air war in Europe and that a closer study of the whole problem of claims can be included in the seventh and last volume of this history. At this writing steps have been taken to work out with the British Air Ministry arrangements to make possible both those objectives.

Fortunately, on the more crucial issue of bomb damage the available record is much more complete and satisfactory. The U.S. Strategic Bombing Survey has gathered and made accessible a great deal of information about the German war economy under air attack. Especially helpful has been the information taken from the Speer ministry papers. While the present authors may not have agreed in every detail with the over-all conclusions of the survey's report, they have not felt it necessary to go behind the compilations and specialized studies upon which that report was based.

In the matter of antishipping claims in the Mediterranean the authors have been less fortunate. There was in that area no JANAC\* to sit in judgment on claims of ships sunk or damaged, and it has been necessary to check as often as possible the AAF and RAF mission reports against enemy records. This method was not wholly satisfactory, since the enemy was not always sure of the agent which sank this or that ship. But the general pattern is clear enough to suggest a possible revision of the dismal appraisal in Volume I of the capabilities of land-based bombers against shipping. Various explanations have suggested themselves—AAF rather than Navy operational control, better crews, better

\* Joint Army-Navy Assessment Commission.

weather, shorter missions, etc.—but for whatever reason, the B-24 and B-17, the B-25 and B-26, were more effective against ships in the Mediterranean than they had proved in the early months of the Pacific war.

These preliminary explanations having been given, there remains only the pleasant task of introducing those who have made this book. All four authors, in their several military grades, were connected during the war with the AAF historical program. Thomas J. Mayock carried the responsibility in the Historical Office, AAF Headquarters, for covering air operations in the North African theater. Arthur B. Ferguson, a member of the same staff, divided his attention between antisubmarine and Eighth Air Force operations. Albert F. Simpson served in Italy as historical officer of the AAF Service Command, MTO. Alfred Goldberg gained his knowledge of air logistics in the ETO as a historical officer first with the VIII Air Force Service Command and later with the United States Strategic Air Forces.

Once again the editors are happy to record their heavy indebtedness to Col. Wilfred J. Paul and Dr. Albert F. Simpson, military and civilian chiefs, respectively, of the Air Historical Group. All members of their staff have contributed loyally to the production of this volume and special acknowledgment is due to: Mrs. Wilhelmine Burch and Mr. P. Alan Bliss for invaluable editorial service; Miss Fanita Lanier, who did the maps and the jacket; Mrs. Juanita S. Riner for her cheerful aid in the preparation of the manuscript; Miss Juliette Abington for help in selecting the illustrations and in compiling the appendix; and, for a variety of helpful acts, to Lt. Col. Garth C. Cobb, Lt. Col. Arthur J. Larsen, Capt. John W. Miller, Capt. William A. Bennett, Dr. Chauncey E. Sanders, Miss Marguerite Kennedy, and Mr. Frank C. Myers. And again, as with Volume I, editors and authors have found at all times friendly and useful criticism from Dr. Kent Roberts Greenfield and his military chief, Maj. Gen. Harry J. Malony, of the Historical Division, Department of the Army. Professors Richard A. Newhall of Williams College, Joseph R. Strayer of Princeton University, and John A. Krout of Columbia University, as members of the Air Force Advisory Historical Committee, have offered welcome advice.

WESLEY FRANK CRAVEN  
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Washington  
29 December 1948

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# SECTION I

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## *THE NORTH AFRICAN CAMPAIGNS*



## CHAPTER 1

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### *CRISIS IN THE MIDDLE EAST*

FOR all its awesome history as a battleground between civilizations, the Middle East did not strike American strategists as an area in which the European war could be expeditiously won. On the other hand, they recognized it as an area in which the global war could be very speedily lost. So, although large-scale U.S. offensives, air or ground, did not figure in the plans for the Middle East (the offensive function against the European Axis being largely reserved for the more convenient United Kingdom base), aid for its British defenders was never stinted.<sup>1</sup> In fact, it was the large degree of logistical support afforded the Royal Air Force in the Middle East that finally, in the spring of 1942, brought the decision to commit an American air force there. The difficulties which shortly thereafter beset the British Eighth Army only advanced the date for that air force's appearance.

The story of the logistical support begins properly before the U.S. entry into the war, with the passage of the Lend-Lease Act in March of 1941.\* When in April the British cleared the Italians from the last of their Red Sea ports, the President promptly, on the 11th, proclaimed the area open to American shipping. Already a trickle of Tomahawks (early model P-40's) had begun to reach the Middle East, brought by ship to Takoradi on the Gold Coast for erection and flown across central Africa to Khartoum over a primitive air route pioneered by the British in the thirties. In March the Air Corps had dispatched a few officers and enlisted men to aid in the operation and maintenance of

\* For a discussion of policies shaping pre-Pearl Harbor aid to the British and U.S.S.R., see Volume I of this series, pages 126-35.

these planes. Besides aiding the RAF in technical matters, these men supplied Washington with firsthand information on the desert air war. In this endeavor, their efforts were supplemented by manufacturers' representatives who reported on the performance of the various American aircraft already in use by the British.<sup>2</sup>

The enormous Axis successes in the Mediterranean area during the spring of 1941 made it abundantly clear that the flow of American personnel and supplies to the Middle East would continue and grow. Moreover, the larger role now assumed by air power had swelled by so much the demand for American aircraft. The Germans had rapidly engulfed Yugoslavia and Greece; and in May the German Air Force put on an air show over Crete, in the process badly battering the British fleet. From Sicily the newly arrived GAF dive bombers were performing so earnestly against British naval power that it became an open question as to whether the German Fliegerkorps or Adm. Sir Andrew Browne Cunningham's tars ruled the waters. Since the defense of Egypt, and of the whole eastern Mediterranean, had been predicated in the first instance on sea power (a conception previously validated by the fine handling of the British fleet), the premises upon which the British had waged war in the Mediterranean area were now subject to modification.<sup>3</sup>

The RAF's severe losses in the Greek campaign had been partially made up by June, when the German invasion of the U.S.S.R. took the heat off the Middle East; but the British still viewed their aircraft situation with misgivings. Rommel's desert army kept the threat to Egypt very much alive; and the British feared that the Axis, operating over its short Mediterranean supply lines, might soon be able to concentrate forces for a blow at Suez. In contrast, the defenders labored under the disadvantage of the long Cape haul; their one direct air route, Gibraltar-Malta-Egypt, was not practicable for short-range fighters, and its bomber and transport traffic was increasingly threatened by the active GAF in Sicily. The Takoradi-Khartoum air route assumed new importance.<sup>4</sup>

In Washington, late in June 1941, the British began discussions with the Air Corps and lend-lease authorities. They proposed that their central African airway be hooked up with American aircraft factories by a ferry route running from Florida through the Antilles to the hump of Brazil at Natal, thence across the narrows of the South Atlantic to Bathurst in Gambia, to Freetown in Sierra Leone, or to

Monrovia in Liberia. There were difficulties: the limited facilities of the Takoradi-Khartoum leg had been responsible for a good many plane crashes; neutral Brazil's permission had to be obtained for flights across her territory; of the available American flyers, few were qualified to undertake transoceanic operations. But some obstacles were rapidly surmounted. With Brazil's assent, Pan-American Airways, which had already undertaken to deliver twenty transports to the British for service on the trans-African run, created three subsidiaries to carry on a ferrying and air transport service. Funds came mostly from lend-lease. The contracts were signed on 12 August. However, largely because of the shortage of trained pilots, only a few transports had been delivered by October. Late in that month, on the 29th, the President authorized the Air Corps Ferrying Command to deliver aircraft to the Middle East; and after Pearl Harbor it was decided to use Ascension Island as a steppingstone to bring Africa within the range of the light bombers badly needed by the RAF, Middle East.\*<sup>5</sup>

While Pan-Am was surveying its new responsibilities, Americans had become involved at the farther end of the route, extending aid to the RAF, which was engaged in echeloning to the rear some of its repair and supply depots after its Delta installations had been severely damaged by GAF bombings in July and August. Halfway down the Red Sea, Port Sudan had been selected for the erection of deck-loaded Bostons and Havocst and crated P-40's, thence to be flown to dispersed storage units near Wadi Halfa and Cairo. The British had decided to fly no more P-40's over the central African route because of the frequency of crashes. Early in September, American technicians and factory representatives arrived to assist the RAF mechanics at Port Sudan.

The RAF was, not unnaturally, handicapped by its lack of familiarity with American aircraft and equipment, even entertaining some prejudice against certain planes on this account. Consequently, factory representatives endeavored to initiate the RAF into the mysteries of American handbooks while U.S. officials undertook to see that the best use be made of lend-lease materiel. Brig. Gen. Ralph Royce, a member of the Harriman mission which visited the Middle East in June of 1941, and Maj. Gen. George Brett, who surveyed the situation in the fall, both advised that greater control over U.S. personnel and installations

\* For a fuller discussion, see Vol. I, 319-28.

† Variant models of the Douglas DB-7, the AAF A-20.



would enhance their efficiency. These recommendations were observed in the establishment of the depot at Gura in Eritrea. Gura, designed to overhaul all types of American engines and planes currently in use in the Middle East, grew out of a British request in the summer of 1941. By a contract signed in December, the Douglas Aircraft Company undertook to operate the depot on lend-lease funds. Gura utilized an old Caproni assembly plant and an airfield near Massaua; it was expected to be in operation by April 1942.<sup>6</sup>

By mid-1941, the growing numbers and diverse activities of American military personnel in the Middle East, and the certainty that more personnel would be sent, called for a new administrative agency. On 27 September, in accordance with an earlier presidential directive, the War Department created the United States Military North African Mission. Brig. Gen. Russell L. Maxwell was charged, in instructions issued on 21 October, with establishing and operating supply, maintenance, and training facilities for the British or other friendly forces in his area. Over the ensuing months, he would also supervise and control the activities of American companies under contract to the British. Brig. Gen. Elmer E. Adler was appointed chief of the mission's important air section. Adler was to have the additional task of advising, on technical aircraft matters, the United States Military Iranian Mission, which, under Brig. Gen. Raymond A. Wheeler, was preparing to enter Iran to help open a southern supply route to the U.S.S.R.<sup>7</sup>

In flying out the members of the Maxwell group, the Air Corps Ferrying Command took the initial action for establishment of a regular transport service to Cairo, Adler leaving on the first plane on 14 November.\* Maxwell arrived via Pearl Harbor, India, and Iraq on 22 November. Little time passed before the shock of Pearl Harbor, and with the subsequent Italian and German declarations of war, the mission found itself aiding not a potential but an actual ally. With this new status of affairs, there inevitably rose the question of deploying U.S. combat units in the Middle East.<sup>8</sup>

The Washington air planners had already considered the area. AWPD-1,<sup>†</sup> proposed in September 1941, envisioned Egypt-based B-29's adding their weight to an ambitious bomber offensive against industrial Germany. But the choice of Egypt did not arise out of any strong conviction of its value as a strategic area. The planners' infor-

\* See Vol. I, 326-27.

† For a full discussion of this basic air war plan, see Vol. I, 131-32, 145-50.

mation suggested that the United Kingdom air base might become overcrowded, and Egypt was the only location available for the overflow—for the balance of the force calculated as necessary to weaken fatally the German war potential. The plan had no relation to the war in the Middle East, except that it assumed the possession of the area by friendly powers.

Following Pearl Harbor, when the American and British staffs met in Washington to lay the basic strategies which were to govern the conduct of the war, they designated the Middle East an area of British responsibility and suggested that because of its distance from the seats of enemy power the as yet weak United Nations' forces might there engage the Axis on comparatively favorable terms. But the ARCADIA conference came up with no specific recommendation for the early deployment of U.S. troops in the Middle East: first call for available forces went to previous commitments in the Atlantic and to the emergency born of Japanese successes in the Pacific.\*

One thing was evident enough: the Middle East had become as important to American communications as it had traditionally been to British imperial communications. The loss of Guam and Wake, in December 1941, had prevented the reinforcement of the Philippines via those islands. The air route employing the island ladder between Hawaii and Australia inaugurated by three B-17's in January 1942 was still in the stage of feverish development. By reversing Columbus' principle it was possible, however, to reach the Indies by flying east. Brett had already flown from Bolling Field, D.C., through the Middle East to Basra at the head of the Persian Gulf. The air route was now extended across Iran and India for delivery of supplies and planes to Java and Burma.

A good part of the Middle East's efforts in early 1942 was absorbed in bolstering the defenses of the Far East, breached by the February disasters at Singapore and in Java and by the menacing Japanese move into Burma. Late in February, Wheeler was ordered to India to develop the port of Karachi. The U.S. Tenth Air Force had been established in India by early March under Maj. Gen. Lewis H. Brereton, who immediately requested that Adler be assigned to head his air service command, but Adler did not arrive in India until 26 April.<sup>9</sup> With the closing of the lower portion of the Burma Road in the first week of March, an air route from Burma to China became a necessity, and when it was in-

\* For a discussion of the ARCADIA conference, see Vol. I, 237-45.

augmented in April Pan-Am's trans-African run lent ten DC-3's.<sup>10</sup> The Combined Chiefs had already recognized the *de facto* interdependence of the China-Burma-India theater and the Middle East.<sup>11</sup> If, so far, the CBI had been mostly favored by this association, it was soon to pay its debts.

### *Advent of USAMEAF*

Meanwhile, the British had been pressing for the dispatch of an American air force to the Middle East, and a number of tentative plans had been drawn in Washington. In response to a January request by Sir Charles Portal, British Chief of Air Staff, Task Force CAIRO was set up, on paper: two groups of pursuit for June 1942 commitment. A little later the AAF opposed augmenting the proposed task force by one heavy bombardment group on the ground that any heavy groups would have to come out of commitments to the United Kingdom. But by mid-March—Portal having made another plea—the problem of air reinforcements for Egypt was being approached from a different angle. It was thought that from the American production allotted them the British might furnish American aircraft types at Cairo; the AAF would furnish personnel. Under this plan the AAF hoped that two medium, one light, and two pursuit groups could be provided at an indefinite future date.<sup>12</sup>

The decisive step was taken in conversations which General Arnold and Rear Adm. John H. Towers opened on 26 May with the RAF in London, conversations which resulted in recommendations as to the allocation of aircraft among the several United Nations. Middle East allocations proved a thorny question in these discussions. The AAF was faced with alternatives, neither of which it relished. Either it could acquiesce in the Middle East's swallowing up large quantities of aircraft and stores to maintain an RAF which had built up its force to a considerable extent with American equipment or it could send its own combat units, replacing altogether an equivalent RAF strength and utilizing aircraft previously allotted to the British. With the growing output of the AAF's training establishment, the latter course was finally chosen, in deference to the principle that if powerful U.S. air forces were to be developed every appropriate American aircraft should be manned and fought by a U.S. crew. By 30 May, nine groups had been tentatively agreed upon for the Middle East: one heavy group complete by 1 October 1942; two medium groups complete by 1 March 1943;

six pursuit groups, two available in the theater by September 1942, two by December 1942, and two by April 1943.\*<sup>13</sup>

Developments since Pearl Harbor had furnished fresh evidence of the importance of air power in the Middle East. In Libya, where the Axis armies were almost totally dependent on sea transportation for their sustenance, secure sea communications were a primary requisite for success. The ably led British Mediterranean Fleet had almost cut off Graziani's supplies at one point in 1940, but of late its surface operations had been greatly circumscribed by the Luftwaffe. However, British submarine and air forces working from Malta and Egypt had been able to redress the balance, so much so that when Rommel began his comeback from El Agheila in January 1942 he started with three days' rations and subsisted mainly on British stores in his drive to the Egyptian frontier. Before supplies could be accumulated for another effort in the desert, the Axis found it necessary to neutralize Malta's air and naval bases and mounted a scale of air attack on the island which cost dearly in Axis aircraft but paid off in cargoes for Rommel. The enemy was also meditating an amphibious assault permanently to remove the island's threat. As Malta inevitably lost some of its effectiveness, Egypt-based planes and submarines were forced to greater efforts.<sup>14</sup> Not only was additional air strength badly needed by the British in the spring of 1942 but because of the long flights necessary to interrupt the Axis sea communications, heavy bombers were particularly prized. Brett had thought B-24's especially suitable for the theater; Col. Bonner Fellers, the U.S. military attaché at Cairo, believed that the big planes could control the shipping in the Mediterranean;<sup>15</sup> that the British appreciated their value can be seen from the repeated attempts they made to persuade the United States to send a heavy group to the Middle East.

As it turned out, the debut of U.S. heavy bombers in the Middle East was prompted by other circumstances: a combination of Japanese success in Burma and the American desire to render all possible aid to the U.S.S.R. The bombers were B-24's of the Halverson Detachment, a prize example of a unit pulled hither and yon by the alarms and crises of early 1942.† The unit was originally set up under the code name HALPRO and trained in the greatest secrecy for the bombing of Tokyo out of Chinese bases, with the proviso that its employment would depend on the global strategic situation which would

\* See below, p.14.

† See Vol. I, 341-42, 493.

obtain when the unit was ready for commitment. When that time arrived, in mid-May, the deteriorating situation in Burma rendered unlikely the prospect that the B-24's could be logistically supported in China. General Marshall then secured the President's approval to divert the aircraft to Egypt for a surprise raid on the Ploesti oil refineries, an enterprise designed to put a spoke in the wheel of the summer drive the Germans were preparing against the U.S.S.R. Negotiations were set in motion to obtain the use of landing grounds in the Caucasus (the Soviet approval came too late to be of any use) and two AAF officers were rushed to Cairo for liaison between Col. Harry A. Halverson and headquarters of RAF, Middle East. The detachment was instructed to proceed to Khartoum and await orders. When the orders came, they directed Halverson to the Delta for the Ploesti mission, and, because of the full-blown emergency which quickly developed in the Middle East, his bombers were fated to remain there.<sup>16</sup>

The RAF made available a plan, on which it had been working for two years, which involved flying via the Aegean, rendezvousing near the target at daybreak for a formation attack, and returning to Egypt over the same route. Halverson, however, whose command constituted an independent task force, finally decided to return to Habbaniyah in Iraq despite the hazard of violating Turkish neutrality. Late in the evening of 11 June, then, thirteen B-24D's took off singly from Fayid, an RAF field near the Canal; twelve proceeded individually to the target, which they reached and bombed at dawn through and below an overcast at about 10,000 feet. Only four of the returning aircraft made Habbaniyah; three others got down at other Iraq fields, and two put in at Aleppo. Four B-24's were interned in Turkey, and the heavy loss—another B-24 had crash-landed—contrasted with the negligible damage sustained by the oil installations. Probably the most favorable aspect of the raid was the impression the big bombers produced on the intensely interested citizens of Ankara.<sup>17</sup>

Despite its modest results, this strike of 12 June was as significant in its way as any the AAF had flown in the six months since Pearl Harbor. It was the first American mission in World War II to be leveled against a strategic target, if the Tokyo raid be excepted. It struck at an objective which later would become a favored target for American bombers. It was the first blow at a target system whose dislocation contributed mightily to the final German collapse. It was the first mission by what later came to be known as the Ninth Air Force.

In June 1942 the British in the Middle East underwent another of their recurrent crises, the gravest and the last they were to sustain. If a year before it generally had been considered that only the requirements of Hitler's drive into the U.S.S.R. had saved Egypt, this time seasoned military observers conceded its possible loss. On 12 and 13 June, just after Halverson's planes had carried out the Ploesti mission, the battle which had been raging for two indecisive weeks in Libya took a turn for the worse. Rommel succeeded in luring Maj. Gen. Neil Ritchie's numerically superior Eighth Army into a tank trap in the Knightsbridge area, the "Cauldron" of sad memory. In the Cauldron 230 British tanks were destroyed.<sup>18</sup>

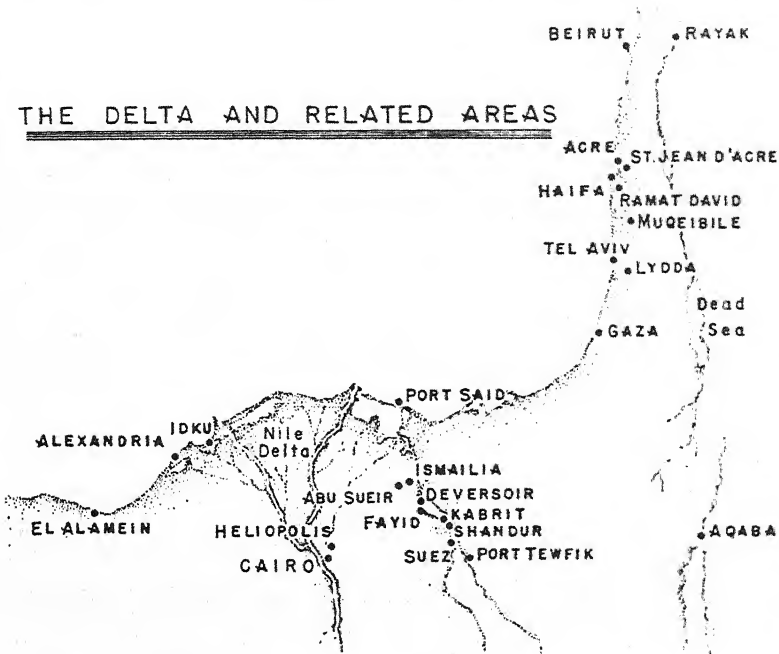
While their desert army staggered under its appalling tank losses, the British were anxiously watching the progress of one of their periodic provisioning expeditions to Malta. The island had been in receipt of a savage Luftwaffe blitz (an invasion, for which a German parachute division was being prepared, had been scheduled to follow Rommel's blow at the Eighth Army). The blitz had all but knocked out the RAF fighter defenses, forced the Royal Navy to abandon Valetta as a base for surface units, and somewhat lessened the worries of Rommel's quartermaster.<sup>19</sup>

Passing ships through to Malta was at best a perilous enterprise; and in hopes of forcing a division of enemy efforts the British had decided on a large operation involving two convoys, one from the east and one from the west, to berth at Malta within twenty-four hours of each other. The convoy westward from Egypt faced the grimmer prospect because it was liable to a greater weight of air attack—from Crete, Libya, and Sicily; the danger here had, moreover, increased, since the RAF no longer held fighter airfields on the Cyrenaican hump. The British chiefs of staff were unhappily convinced that the Axis knew all about the projected blockade run and was preparing a warm reception. Thus, when Halverson's long-range bombers made their appearance in the Levant, Air Chief Marshal Sir Arthur Tedder, the air officer commanding Middle East, perceiving their value in the event of a sortie by the Italian fleet, requested through British channels their assistance in fighting through the convoy. After some hesitation the War Department approved on 10 June, just before the Ploesti mission.<sup>20</sup>

Convoy A passed eastward through Gibraltar on 13 June, took its losses, and came into Malta on the 16th. Convoy B, westward from Egypt, had been in motion three days when, on 15 June, seven of



Halverson's B-24's and two Liberators of 160 Squadron, RAF, were ordered out with torpedo-carrying Beauforts against the Italian fleet, which had now put to sea. Locating the fleet, the Beauforts sank a cruiser, and five of the USAAF planes bombed, claiming hits on a *Littorio*-class battleship and a *Trento*-class cruiser. Had their British bombs been heavier (2,000-pounders instead of 500-pounders) the damage might have been crippling; as it was the fleet did not reduce



speed. According to the RAF, however, the damage inflicted by the Beauforts and the B-24's kept two battleships in dock for the ensuing three months. Returning to base at minimum altitude, the bomber formation encountered and shot down an Me-110, achieving the first aerial victory in which Americans had participated in the Middle East. Convoy B, however, was forced to turn back, its ammunition expended fighting off repeated air attacks.<sup>21</sup>

Because of the difficulties which HALPRO as an independent task force had posed in combined operations with the British,<sup>22</sup> on 16 June General Maxwell suggested to Washington that Halverson be instructed to report to him as chief of the North African mission.<sup>23</sup> The War Department, for its part, had been planning for some time to

appoint Maxwell commander of a U.S. Middle Eastern theater with boundaries coterminous with those of the British Middle East Command—a measure calculated to establish unified control over the bulk of the Army activities in the area.<sup>24</sup> In fact, by the 16th, a letter had been prepared relieving Maxwell of his mission command and designating him commanding general of U.S. Army Forces in the Middle East (USAFIME). The cable which went out on the 17th to advise him of his new status also informed him that the Halverson Detachment had been directed to assemble in the vicinity of Cairo and report to him, the news of the attack on the Italian fleet having evidently convinced the War Department that, for the time being at least, the B-24's would be most useful in the Middle East.<sup>25</sup> On 19 June, Maxwell formally assumed command of USAFIME. He was given to understand, however, that if the parlous situation in the Middle East necessitated the sending of an American ground-air task force, its commander would also command USAFIME.<sup>26</sup>

Maxwell was still pondering his sudden elevation and new responsibilities when the British suffered fresh disasters. Gen. Sir Claude Auchinleck had had no intention of allowing any part of his forces to be shut up in Tobruk, but enemy successes on its flank finally isolated the fortress. Nevertheless, ninety-day provisions for a garrison of over 25,000 were stored behind the port's fortifications. With Tobruk constricting Rommel's supplies, the Eighth Army could stand in the strong frontier positions at Sollum and Halfaya Pass, and before ninety days it could expect to be back. Rommel overwhelmed Tobruk on a single day, 20 June, and what had been a limited drive in the desert became an all-out attempt on Suez.<sup>27</sup>

On 17 June, Churchill had left England for the United States and another of the periodic war conferences. As he afterward admitted to Commons, at the time of his departure neither he nor Sir Alan Brooke, chief of the Imperial General Staff, had been made fully aware of the disaster befallen the Eighth Army at Knightsbridge. Once in Washington and apprised of the danger, Churchill made a powerful plea for American military aid, and especially air aid. His sentiments were seconded by urgent messages from Colonel Fellers warning that only the employment of Axis energies elsewhere had so far saved the Middle East. Should the enemy immediately take the offensive, the only assistance that could be provided in time would be that of the heavy bombers.<sup>28</sup>



The American Joint Chiefs, who were interested in husbanding their resources for decisive air and amphibious actions in western Europe in 1943, were thus presented with a dilemma. To lose the Middle East meant to lose the southern supply routes to the U.S.S.R. and the main air ferry route to India. India itself would be rendered difficult, if not impossible, to defend, and the life line to China would be correspondingly endangered. Loss of the oil wells in Iraq and Iran would be a most severe blow, tantamount to cessation of Allied air and naval activity in the Indian Ocean. The economic gain to the Axis, although admittedly substantial, would not be so great as the economic and strategic loss to the Allies. And the key to the Middle East was Egypt: the best hostile avenue to the Persian Gulf, the Allied base most convenient for reinforcing any threatened part of the Middle Eastern area.<sup>29</sup>

Despite the vigor of the Prime Minister's demands, the Americans succeeded in the end in restricting their troop commitments to Air Corps units, although for a short time it was planned to send an armored division under Maj. Gen. George S. Patton, Jr., and generous amounts of materiel continued to flow to the Middle East.<sup>30</sup> Especially useful for the desert war were the new Sherman tanks for, as an English observer put it, at that date in the war the British had still not produced a tank capable of taking on the Panzers on even approximately equal terms.<sup>31</sup>

The Air Corps' commitments were set forth in the Arnold-Portal-Towers agreement, signed on 21 June and approved by the U.S. Joint Chiefs on the 25th.\* As agreed in London in May, nine combat groups were to go to the Middle East; but the dates for their commitment were advanced, and in contrast with other earlier paper commitments the Combined Chiefs bent every effort to get the units in motion. A group of heavies was to be at full strength in the theater by October 1942, one group of mediums operational in the theater by September and another by the end of the year. Six groups of pursuits were to be sent on the following schedule: one by 1 September 1942, one by 1 October, two by 1 January 1943, and two more by 1 April. On 27 June, The Adjutant General gave Maxwell somewhat more detailed information on the tentative build-up of the air force for his theater. Besides the groups listed above, there were "on order" headquarters units for an air force, a fighter command, and an air service command.

\* For full detail, see Vol. I, 566-70.

The air service command would comprise two air depot groups, sailing in September 1942 and March 1943, and five service groups, one each moving in July and October 1942, two in December, and the last in March 1943.<sup>32</sup> These USAAF units were understood to be in lieu of RAF units which otherwise would have gone to the Middle East.

As always, the chief difficulty in deploying these units consisted in finding shipping for them without deranging other approved military movements, such as the BOLERO concentration of U.S. forces in the United Kingdom which at this time took precedence over the various global commitments. By 25 June some progress had been made: Admiral King had approved the use of the aircraft carrier *Ranger* to ferry P-40's to Takoradi, whence they could be flown by their pilots over the established route across central Africa and by way of Khartoum to Cairo; the British had agreed to the use of the S.S. *Pasteur*, a fast 22-knot personnel ship, to bring 4,000 Air Corps troops into Egypt. Since the initial AAF combat groups were to go minus maintenance units, the Air Ministry had already advised Tedder that British maintenance personnel would have to be provided.<sup>33</sup>

For more immediate aid to the hard pressed British, the War Department turned to India. Fellers had previously recommended that the CBI furnish heavy bombers for the Middle East. In his opinion, if the Middle East went, so went India; the converse, which he alleged to be the British strategic emphasis, he regarded as untrue. The War Department may have shared his views, or reasoned that the imminent monsoon season would ground the CBI bombers. At any rate, on 23 June a message went out to Brereton, ordering him to Egypt on temporary duty to assist Auchinleck. Brereton was to take with him such heavy bombers as he could muster. On arrival he was to make use of Maxwell's headquarters for liaison and coordination with the British; and eventually, when the emergency had passed, he would return to India. General Stilwell was so advised. Brereton interrupted a staff meeting at New Delhi to read the cable ordering him to Egypt. He combed from his by no means redoubtable air force nine B-17's of the 9th Bombardment Squadron; "near cripples," they were described. Two days later he left India. Altogether 225 men flew in his party, in bombers and transports, prominent among them Adler and Col. Victor H. Strahm.<sup>34</sup>

On 28 June, upon Brereton's arrival at Cairo, Maxwell's headquarters issued orders placing him in command of the U.S. Army Middle East

Air Force, comprising the Halverson Detachment, the Brereton Detachment, and the air section of the North African mission. Brereton then activated the USAMEAF in his first general order.<sup>35</sup> Subordination to Maxwell came as an unexpected shock to Brereton, whose instructions were merely to use Maxwell's headquarters for liaison and coordination with the British. Brereton's initial reaction to USAFIME was that it was an extra and unnecessary link in the chain of command, likely to cumber relations with the British and, consequently, his combat operations—a link, moreover, presided over by a ground officer junior to him. Whatever initial coolness this situation caused between the generals soon gave way to cordial relations which endured throughout Maxwell's tenure as theater commander, a tenure which from the outset was understood to be temporary.<sup>36</sup> Also activated on 28 June was the Air Service Command, USAMEAF, of which Adler assumed command. Adler's chief immediate duties were to see that requests for supplies and equipment went to appropriate RAF elements, for no service units or Air Corps supply existed in his command.<sup>37</sup>

Brereton's initial force was small, but in the former air section of the North African mission he gained the services of a number of men quite familiar with the tactical and logistical problems of the Middle East. The help earlier extended to the British was paying dividends. At Gura was a depot for the repair of American aircraft. Moreover, the North African mission had turned to account its observations of the Mediterranean war by laying plans for the advent of an American air force, a development its members had considered only a matter of time.<sup>38</sup>

Furthermore, in its formative days USAMEAF could lean on the RAF, Middle East, a fine fighting force destined to pass on to Brereton's command, and eventually to the whole Army Air Forces, lessons it had learned in the stern school of experience. Except for its hopeless struggle in the Greek and Cretan campaigns, the RAF, ME had consistently maintained an ascendancy over its Italian and German opponents. In June 1942, at the moment when USAAF reinforcements were being rushed to the defense of the Delta, the RAF was carrying out a furious offensive against the Axis columns rolling into Egypt. When the military observers had the leisure to study the campaign, they concluded that the RAF's unprecedented offensive protecting the retreat of the Eighth Army had prevented that retreat from becoming a rout. The army might not have stopped at El Alamein.<sup>39</sup>

Under Tedder there were a number of principal subcommands. Air Vice Marshal Sir Arthur Coningham, as the commander of the Western Desert Air Force, had the primary responsibility of cooperating with Eighth Army headquarters. Air Headquarters, Egypt, defended the army's lines of communication, the Canal, and the cities of the Delta, while Air Headquarters, Malta, operated the RAF squadrons in that beleaguered isle. No. 201 Group cooperated with the Royal Navy on such matters as air protection for friendly shipping, reconnaissance of and strikes against Axis shipping, and antisubmarine patrols. No. 205 Group operated what heavy and medium bomber squadrons the RAF possessed. It should be mentioned that there was no unified British command in the Middle East. Tedder as air officer commanding in chief enjoyed a coequal status with the army and navy commanders in chief, at that time General Auchinleck and Adm. Sir Henry Harwood.<sup>40</sup>

While Brereton had been stripping India of bombers preparatory to departure for the Middle East, the Halverson Detachment, as the only AAF combat unit in Egypt, was adding what weight it could to the efforts to stop the drive on Suez. As ordered by Washington, it worked under the operational direction of the RAF (No. 205 Group), and it struck at the harbors serving Rommel. Halverson had hoped to go on to China, but the War Department, after consideration of the situation in Burma, ordered him to stay on in the Middle East, once again "temporarily." On the night of 21/22 June, nine of the B-24's raided Bengasi harbor after British Wellingtons had lit the target with flares and incendiaries. Three nights later the mission was repeated; after this raid Bengasi passed out of range of the Wellingtons as the progress of the Axis armies forced the RAF successively closer to the Delta fields. Tobruk was added to the list of the detachment's targets on the 26th when a diversion was flown by the B-24's for an Albacore attack on two merchant vessels.<sup>41</sup>

At the end of June, when USAMEAF was set up, the British were feverishly preparing the defense of the Delta. Auchinleck had sent posthaste to Syria and Lebanon for the British Ninth Army's only effective units. If he could hold until the reinforcements coming from England by the Good Hope route could reach him, he might not only save Egypt but the Eighth Army might eventually once again pass over to the offensive. But it was with no thought of an immediate offensive that Auchinleck took over personal command of the Eighth. By

1 July he had dug in at El Alamein on a thirty-two-mile line stretching from the sea to the Qattara Depression, the desert's last good defensive position. By 3 July the heavy units of the British fleet had withdrawn through the Canal to the upper reaches of the Red Sea, and a general civilian and military exodus from Egypt had begun. Brereton and Maxwell were perfecting plans to fall back with their heavy bombers toward the Persian Gulf area, in case the Eighth Army were destroyed.<sup>42</sup>

Brereton had already on 30 June sent his B-17's to Lydda in Palestine, but the Halverson Detachment stayed on at Fayid until 16 July. Both units operated directly against Rommel's supplies, which were becoming increasingly inadequate owing to the normal difficulties of administration under conditions of mobile warfare and to the considerable distance separating Tobruk, the nearest major port, from the battle line at Alamein. Between 26 June and 5 July, nine missions were flown, all but one against Tobruk. The B-17's of the 9th Squadron participated in two attacks, one by night, and the B-24's, sometimes in company with the RAF's Liberator squadron, also operated both by day and by night. All missions were, by later standards, on an extremely small scale, no more than ten American bombers setting out on any single occasion; moreover, available records do not give any detailed estimate of the damage inflicted. Generally speaking, the opposition, either by AA or intercepting fighters, was not very effective. One B-24 failed to return from a mission on the night of 29/30 June, during which an enemy night fighter appeared, but no connection was established between these events and the crewmen were simply put down as missing. The only attack not directed against Tobruk was carried out after dark against an enemy convoy and succeeded in firing a tanker.<sup>43</sup>

The immediate threat to Egypt subsided in a series of stubborn battles on the Alamein line in which the initiative gradually passed to the Eighth Army. The Axis units had been pushed to the limit of endurance in their career into Egypt, while the Eighth Army had fallen back on strength. Moreover, the RAF, despite the necessities of successive retreats, continued to best the GAF and the IAF and to harass the weary enemy ground forces. The RAF bag of Stukas was particularly comforting during these operations. Although stalemate had been reached on the Alamein line by the end of the first week in July, not until the end of the month did the opposing armies accept the situation and settle down for rest while awaiting reinforcements.<sup>44</sup>

*The Tide Turns*

For the war in the Western Desert there were what may be called, for convenience, primary and secondary lines of supply. The primary lines were the water routes over which the sinews of war moved to the African ports. The secondary supply lines extended from the ports of entry to the front. In the first category the Axis always had the advantage of the short haul across the Mediterranean. Because the Mediterranean was closed to the Americans and the British, their haul was, on the other hand, of fantastic length—it is 13,000 miles from England to the Suez via the Good Hope route—and, although this supply line was never seriously endangered by air or submarine attack, it imposed an almost intolerable strain on Allied shipping resources. In one particular, however, the Allies had the advantage—their proximity to the oil refineries in Iraq. From Bahrein and Abadan came 100-octane gas.

When the battle line was stabilized at El Alamein, the secondary lines of supply began heavily to favor the British; the Suez depots, if anything, were a little too close to the front. Rommel, on the contrary, had overextended himself: he was relying largely on British supplies captured during his advance; his nearest port of any size lay at Tobruk, 350 miles to the rear. He controlled as well, of course, Matruh's small harbor, 150 miles back, and Bengasi, 600 miles away. If the enemy powers could have supplied and fueled a large air force and wrested air superiority from the RAF, they might have, with bomb and aerial mine, severely impaired the flow of Allied supplies at Suez. In the nature of the case the Axis could do neither, and its own supply line began to fail under air and sea attack.

The main Axis shipping routes to North Africa gave Malta a wide berth. One route was as follows: leaving Naples the ships made for Palermo, skirted Sicily's western tip, ran for Cap Bon, kept close in-shore along Tunisia and Tripolitania to Tripoli; from there they might hug shore to Bengasi or undertake to dash across the Gulf of Sirte. Smaller craft then crept on to Tobruk, Derna, or Matruh. Alternately, ships out of Naples could proceed by way of the Strait of Messina and the heel of Italy and join the route leading from Brindisi and Taranto along the Greek coast and thence across to Tobruk. A variation of this eastern route involved a passage through the Corinth Canal and a stopover at Crete.



Convoys plying these lanes were given aerial as well as naval protection. On the southward runs from Greece and Crete the Germans provided day-fighter escort, Me-109's or 110's from both Libya and Crete, the Me-110's carrying antisubmarine bombs and depth charges which they jettisoned on approach of hostile aircraft. During the summer of 1942, the enemy introduced a new feature to ease his maintenance problem at Alamein—tank landing craft (F-boats) which sailed in convoy from Tobruk to Matruh. But after some experimentation the RAF found a method of attacking the heavily armed F-boat which forced the enemy pretty largely back on road and rail transportation for moving supplies east of Tobruk.

An incessant campaign against enemy provisioning was carried out by airplanes and submarines based on Malta and in Egypt, the importance of the Delta gaining as the recurrent blitzes hindered Malta's operations. The RAF's Egypt-based 201 Group had been formed in September 1941 in anticipation of the attempted neutralization of Malta, and with the cooperation of 205 Group, of Air Headquarters, Western Desert, and of the newly arrived USAAF the battle went on unabated during the critical summer months of 1942, with special attention being paid to tankers. The Americans began to take their heavy bombers not only to Tobruk, Bengasi, and Matruh but to Navarino Bay in the Peloponnesus and Suda Bay off northern Crete, assembly points for convoys, and to places as distant as the Corinth Canal.<sup>45</sup>

On 20 July, the Brereton and Halverson detachments at Lydda, previously given squadron designations, were organized under Halverson's command as the 1st Provisional Group. Their combined strength was not impressive, being reported by Brereton as nineteen B-24's and nine B-17's, of which on 19 July seven and three, respectively, were operationally fit. At this point, however, the promised reinforcements began to arrive from the States, the air echelon of the 344th Squadron of the 98th Group (B-24's) coming into Ramat David, Palestine, on the 25th. By 7 August the complete group was in the Holy Land under Col. Hugo P. Rush, two squadrons apiece at Ramat David and St. Jean d'Acre. The 98th carried with it enough small spare parts for the anticipated period before its ground echelon would arrive, a wise precaution considering the limited facilities of USAMEAF Air Service Command.

For targets westward of Egypt it was normal course for USAMEAF's

heavies, which received their mission orders and plans from 205 Group, to stage through Fayid where the briefing was accomplished and whence the bombers took off for Tobruk or Bengasi. Unfortunately, communications were not too efficient and the necessary warning orders were not always early enough for the American commanders in Palestine. This problem led to the establishment of a small operational staff at Fayid and of Maj. Alfred F. Kalberer as liaison officer with 205 Group at Ismailia.<sup>46</sup> Malta and Egypt sent out the photo-reconnaissance Spitfires and 205 Group determined the targets. From 5 July to 30 August the American planes carried out an average of five missions a week, working by day in the excellent Mediterranean summer weather or going out on night strikes with the RAF. The B-17's, unable to reach Bengasi harbor from Fayid, concentrated their efforts on Tobruk, which as Rommel's most important depot attracted the greater share of the combined bomber effort. Attacks on convoys at sea or in Greek waters accounted for about a third of all the USAAF heavy bomber missions. On the night of 5 July, however, the Hal Squadron, the redesignated Halverson Detachment, struck at Bengasi and caused a terrific explosion, thought to represent a hit on an ammunition ship in the harbor.

Four days later, on an unsuccessful hunt for a convoy, six of Hal Squadron's B-24's were attacked by four Me-109's; two of the fighters were shot down, but a B-24 and crew were also lost. When convoys were engaged, however, the results were often excellent: on 22 July, Hal Squadron hit two ships in Suda Bay; on the 27th it hit two more in the open sea; on the 30th a merchantman in Navarino Bay took a bomb. RAF reconnaissance confirmed that as the result of an attack on 1 August a 10,000-ton tanker, one of a class supplying the bulk of Rommel's oil and gas, went to the bottom. On 21 August nine B-24's from two squadrons of the 98th Group engaged a convoy just southwest of Crete; two more merchant ships were scored as probably sunk. Two Me-110's and an Me-109 attacked the bombers and forced one B-24, which was straggling, to come down in the sea. Three days later an unsuccessful attack was made on the Corinth Canal. The damage inflicted on Tobruk or Bengasi by any single attack during this period is hard to evaluate.<sup>47</sup>

Although USAMEAF operations proceeded on a modest scale, they demonstrated the larger fact that the Middle East was an area in which the employment of heavy bombers was peculiarly lucrative. Brereton



made this the central theme in his first strategic estimate, dispatched home by cable on 5 August, after he had found time to study the general character of the Middle Eastern war.<sup>48</sup> He indicated three major objectives for the Allied air forces: to assist the destruction of Rommel by direct and indirect air support to ground troops; to secure the sea and air communications on and over the Mediterranean; to carry out a sustained air offensive against Italy and the vital oil installations at Ploesti and in the Caucasus, should the latter fall into Axis hands.

Brereton believed additional bombardment aircraft necessary before the Eighth Army could take the offensive with good prospect of success. He asked, therefore, in order to meet this first requirement, that the established schedule of USAAF units for the Middle East be revised to permit the sending of the units "at the earliest possible date"; and that two heavy groups, preferably B-24's, and two light or medium groups, preferably dive bombers, be added to the Middle East commitment and dispatched "immediately." These aircraft were to be used for direct action against the Axis army, against the desert-based GAF and IAF, and for "indirect support" against ports and sea lanes.

The attack on the ports and sea lanes would forward the second objective: securing the sea and air communications in the Mediterranean. Brereton pointed out that Malta, formerly the best base for interfering with enemy convoys, had seen its effectiveness restricted by repeated bombing attacks; nor was the British surface fleet in any condition to interfere. The bombardment aircraft based on Palestine or Egypt was the only available weapon to fill the gap. Therefore, to accomplish this second objective, Brereton asked for two additional heavy groups and two torpedo-carrying dive-bomber groups over and above the current commitments to USAMEAF. He reminded the War Department that Mediterranean weather was favorable to air operations, that airdromes were easily constructed and airdrome space presented no problem, and that enemy defense against air attack was weaker than in northwestern Europe. Moreover, the British were prepared to furnish initial maintenance for USAAF groups moving by air.

If the Eighth Army could defeat Rommel and thereby secure Cyrenaica's airdrome sites, the sustained air offensive against Italy, Ploesti, and other strategic targets (objective number three) could become a reality. Malta would be more easily supplied and her offensive capabilities revived. Then a heavy bomber offensive based on Malta and

Cyprus would bring all of Italy, and the Balkans south of Bucharest-Budapest, within range; if combined with an air offensive out of England against Germany, the result might be to knock Italy out of the war. Two more heavy groups would be necessary for this phase.

Brereton believed the strategic opportunity so great—the Mediterranean could be opened in the sequence of these operations—that diversions from other theaters were justified to find the ten groups necessary. “Nibbling” at such vital targets only gave the enemy time to prepare his defenses.

Others besides Brereton—and besides Maxwell and the British chiefs in the Middle East by whom his strategic estimate had been approved—thought the time ripe for a blow to open the Mediterranean, although their thinking was not so much influenced by the realization of a strategic opportunity at hand as by the seeming imminence of a defeat of catastrophic proportions. The Germans and their puppet armies on the eastern front had devoted July of 1942 to clearing the Soviet forces almost entirely out of the Don bend. The next Axis move obviously would be towards the Volga and the oil-rich Caucasus—the land bridge to Asia. Loss of the Caucasus might not put the U.S.S.R. altogether out of the war, but it would imperil the vital Persian Gulf area and endanger Egypt and the lands between. These possibilities seemed to put flesh on the nightmare of Allied strategists, the junction of European and Asiatic enemies on the shores of the Indian Ocean. That Germany and Japan had no such plans for a coordinated strategy was not then known to the Allies.<sup>49</sup>

The deteriorating situation on the eastern front occasioned a major revision in Allied strategy. By August the American and British governments had decided to mount in 1942 Operation TORCH,\* landings on the Atlantic and Mediterranean coasts of Northwest Africa, as the most practicable means of relieving the pressure on the U.S.S.R. and of removing the menace of Rommel from Egypt. TORCH was to be coordinated with a renewed offensive by the Eighth Army. It replaced ROUNDUP, the landing in France projected for the spring of 1943.

By these circumstances the Mediterranean achieved a higher relative importance as a theater of war. Hence, it might have been reasonable to expect that Brereton's plea would have found favor† and that

\* See below, pp. 46-47.

† Brereton probably was not aware of TORCH when he dispatched his strategic estimate.

USAAF forces in the Middle East would be reinforced for the coming operations. But just prior to the receipt of Brereton's cable the Joint Chiefs had successfully resisted a similar suggestion from a higher quarter. On the evening of 30 July, General Arnold had received a summons to the White House. He found there with the President, Adm. William D. Leahy, Brig. Gen. W. Bedell Smith, and Colonel Fellers, the last just back from Cairo. Fellers had delivered a very pessimistic report on the British ability to hold the Nile. On the President's querying as to what the United States could do to help, Fellers had indicated aerial reinforcements as the most practicable form of aid. These planes, explained Fellers, would operate against Rommel's supply line. Arnold commented that substantial reinforcements were already on the way to Egypt and that any further reinforcements to the area would injure the Eighth Air Force, TORCH, or the Pacific theaters. The President nonetheless desired that the Joint Chiefs look into the matter.

On 1 August the AAF, in a memorandum to the Operations Division of the War Department, set forth existing air commitments to the Middle East and suggested paring down allocations to the Caribbean as the most suitable means of providing reinforcements for USAMEAF. According to General Arnold, the question of Middle East reinforcements was taken under advisement by the Joint Chiefs as early as 3 August, two days before Brereton's strategic estimate was dispatched. The upshot of their deliberations was that USAAF aid to the Eighth Army could be best accomplished by speeding up the movement of units already allocated to USAMEAF—admittedly a limited solution.

Thus when the reply to Brereton's request for reinforcements went out to Cairo on 8 August it indicated that "because of other important projects" it was not "probable" that his air force could be increased beyond the present commitments. TORCH had clearly become the No. 1 project on the Allied agenda, and although the Middle East shortly received a priority in shipping second only to TORCH it was soon to become evident that with the limited Allied resources only the No. 1 priority was really comfortable.<sup>50</sup>

This was borne out by diversions shortly inflicted on USAMEAF. It was generally understood that Brereton's command would be redesignated as the Ninth Air Force and, as promised in June, the AAF was training headquarters units for an air force, a fighter command, and an

air service command. In August these units ran afoul of the needs of the new Twelfth Air Force being set up for TORCH, were diverted, redesignated, rushed to England, and eventually landed at the opposite end of the North African littoral. Not until November did USAMEAF become the Ninth Air Force.\*

Potentially more serious was the diversion of the 33d Fighter Group (P-40's). The 33d was intended to fulfil the schedule set up by the Arnold-Portal-Towers agreement by which the second fighter group allocated to USAMEAF was to arrive in the theater by 1 October 1942.† On 5 September, however, Brig. Gen. James H. Doolittle, commanding the Twelfth, requested that the 33d be turned over to him for use in the action against Casablanca in French Morocco. The reaction to this proposal was mixed, for it was generally believed in Washington and London as well as in the Middle East that a high degree of air superiority in the Western Desert would be a great help to TORCH. Moreover, the 33d was ready to depart for the Middle East. The matter was finally left up to Eisenhower as TORCH commander; the 33d went to Casablanca. At the same time he stressed that P-40's were urgently needed in Egypt, and the War Department, taking the same view, set up the 79th Group as a replacement.<sup>51</sup>

The initial reinforcements promised by the Arnold-Portal-Towers agreement, however, had moved quickly to the Middle East. The aircraft of the 57th Fighter Group—of which Lt. Col. Frank H. Mears, Jr., was commander—left Quonset, Rhode Island, aboard the *Ranger* on 1 July; when the carrier was within 100 miles of Africa the P-40's were flown off to begin their journey over the ferry route. The movement across Africa was very skillfully accomplished. Ground crews in transport planes followed the fighters, spending the nights readying the P-40's for the next day's flight, so that a negligible percentage of aircraft was lost. By 31 July the complete air echelon was at Muqbil, Palestine, where a small number of the 57th's key personnel, traveling entirely by air, had arrived two weeks earlier.<sup>52</sup>

At about the same time the 12th Bombardment Group (M), commanded by Col. Charles Goodrich, was added to USAMEAF. Proceeding via Florida, the Antilles, Brazil, and Ascension, the air echelon also took its B-25's across the central African route, completing the movement without losing a plane. The aircraft left Morrison Field, Florida, between 14 July and 2 August and were all in the Delta by

\* See below, p. 39.

† See above, p. 14.

mid-August, the 81st and 82d Squadrons at Deversoir and the 83d and 434th at Ismailia.<sup>53</sup>

When the *Pasteur* came into Port Tewfik on 16 August, not only was the personnel of USAMEAF greatly augmented but its supply and maintenance prospects materially improved. Aboard were the ground echelons of the 57th Fighter and the 12th and 98th Bombardment Groups; their arrival permitted the relief of the unarmed RAF squadrons previously attached to take care of the base and maintenance requirements of these groups. Only the 1st Provisional Group was left still leaning on similar British assistance. Moreover, also on the *Pasteur* came the 323d Service Group, which promptly became a jack-of-all-trades in USAMEAF Air Service Command.

General Adler had been facing several problems unusual in an air service command. No American depot existed nearer than Gura, 1,200 miles down the Red Sea, and the RAF suggested that it take over AAF supplies and make them available to AAF units through RAF distribution depots. Adler and Brereton, knowing the way of depots, reasoned that the AAF would get very few of these supplies back. The alternative, of course, was an AAF depot. That meant a depot site. Because the British, backed up against the Delta, were using every available Egyptian airdrome, a decision was finally taken in favor of Rayak in Syria, which offered the desired facilities—a good airdrome, hangars, warehouses, and quarters. Although Rayak's location was far from ideal, the choice was justified. At the time, most of USAMEAF's combat groups were stationed in Palestine, with the 57th even having a squadron training over in Cyprus; moreover, Rayak permitted the use of American methods of supply which Brereton believed a matter of the utmost importance. The 323d Service Group, as the only service unit in the theater, took on the job of running Rayak. It also furnished detachments for unloading at the ports and for base unit and quartermaster functions at the heavy bomber airdromes. In fact the group did about every job except the one for which it was trained, and performed excellently in all capacities.<sup>54</sup>

The American heavy bomber units, the Brereton and Halverson detachments and, later, the 98th Group, had gone into action immediately after their arrival in the Middle East. Heavy bombers were scarce and badly needed in the struggle against Rommel. With these AAF organizations, unit training and command experience were adequate for operations against ports and convoys; as no long-range

fighter escort could be provided, the aircraft could be employed fairly independently of other commands. On the other hand, the 12th Bombardment (M) and the 57th Fighter Groups, entering upon a highly cooperative type of air warfare under unfamiliar desert conditions, were fed into existing RAF formations. The training they received and the accumulated experience made available to them contributed greatly to their subsequent successes.

Elements of the 57th's advance air echelon, arriving in mid-July, were trained at Muqebile and in actual combat in RAF formations in the Western Desert. The squadrons, which arrived in mid-August, were trained in the back areas, in Cyprus and at Muqebile; elements of the 66th, however, did participate in the operations opposing the Axis smash at the Alamein line early in September. Not until 17 September did the entire group assemble at Landing Ground (LG) 174 in the desert. Here its P-40's served as an air force reserve and saw only occasional action until well into October. The 57th's pilots were filtered into the three-echelon V formation then in use by the RAF, flying first top cover, then support, then in the most exposed low-echelon position. The group discovered that all RAF fighter units were completely mobile and that their ground echelons were divided into A and B parties for the leapfrogging technique used in the recurrently fluid desert war. The 57th was initially short of the vehicles necessary for such mobility, but by mid-September, after some difficulty, enough had been secured.<sup>55</sup>

The 12th Group, based along the canal, began under the tutelage of RAF and South African Air Force (SAAF) light bomber wings. A month's training ensued, including five missions intended to acquaint the crews with the aids to navigation available in the Middle East. The first of these missions, night operations against the port of Matruh and the enemy airdromes at Daba and Fuka, proved that without flame dampeners to black out the bright spurt from their exhaust pipes the B-25's were easy targets for AA and night fighters. Further difficulties arose in locating targets by day in the monotonous desert. By the end of August, nonetheless, the group had made rapid progress and it contributed forty-eight sorties to the light bomber effort at the time of the Axis repulse.<sup>56</sup>

The Western Desert Air Force, to which USAMEAF's fighters and mediums were attached, had developed techniques of air-ground co-operation representing the first sensible advance over the system of



intimate "support" employed with such telling effect by the Luftwaffe in Poland and France. The men associated with these techniques, the long-term effect of which was to emancipate both the RAF and the USAAF from subservience to ground commanders in land campaigns, were Coningham, the AOC Western Desert, and Tedder, top air officer in the Middle East. Coningham's force had performed magnificently in the disastrous action precipitated by Rommel's May attack on the Eighth Army's Gazala position; in the RAF, Middle East's own words, "Any lingering idea that the R.A.F. was simply a useful adjunct of the land forces . . . was finally swept away."<sup>57</sup>

Brereton quickly grasped the importance of drawing on Western Desert Air Force experience. Ten days after his arrival in Cairo he was urging the War Department to dispatch qualified observers to study Coningham's employment of fighters and light bombers; and on 22 August he submitted to AAF Headquarters a report on the "support" rendered the Eighth Army in the period 26 May to 21 August.<sup>58</sup>

By general admission, the foundation of the RAF's success in cooperating with the army lay in the sympathy and understanding normally existing between the commander of Western Desert Air Force and the commander of the Eighth Army. Although operations against the Axis armies proceeded, naturally, under the general direction of the ground arm, the army and air commanders maintained a joint air-ground headquarters embodying the idea of coequal striking forces.\* There they worked towards a common goal, neither commanding the other's forces, yet each cognizant of the other's requirements. Even the headquarters location was a compromise between the needs of the two arms: the air commander had to be within ten miles of the bombers and fighters he controlled and adjacent to a landing ground for his own use; a position forty to sixty miles behind the front was usually acceptable to the ground commander.<sup>59</sup>

With his forces centralized under his own control, Coningham had been able to seize and hold the ascendancy in the air without which he could not have efficiently aided the Eighth Army. Under him, No. 211 Group controlled the fighter squadrons, the basic weapons of air superiority. By use of an efficient radar screen the group directed the squadrons in their constant war with the enemy fighters and in their

\* The Brereton report evidently did not refer in this particular to the situation during Auchinleck's personal command of the Eighth Army. Auchinleck's headquarters was separate; Montgomery moved back with the RAF. (Cf. Francis de Guingand, *Operation Victory*, p. 138.)

escorting of the bombers to hammer the enemy airdromes. To construct its airdromes 211 Group controlled a detachment of Royal Engineers; to protect the fields, it provided armored-car squadrons and an antiaircraft brigade. Its fighter types consisted of the obsolescent Hurricane, American-made Tomahawks and Kittyhawks (P-40D's and E's), and Spitfires, the last considered the best answer to the Me-109, although the Kittyhawk could handle it under 12,000 feet.

Besides 211 Group, WDAF employed light bomber wings of Bostons (A-20's) and Baltimores (A-30's), whose bombardment operations were augmented by bomb-carrying Hurricanes and Kittyhawks. The extensive use of fighter-bombers by the RAF was itself an indication of the degree of air superiority it had achieved, for without air superiority the fighters would have had enough to do in their normal roles. The operation of the Bostons and Baltimores had become very skillful, and the fighter escort kept losses from enemy interception to a minimum.

Coningham's coequal status with the army commander allowed him to exploit to their mutual advantage the peculiar capabilities of air power. His planes were not tied down to ground formations in "penny packets." They were not wasted on fleeting or unsuitable targets but were available for concentrated blows. Since his force had been kept fully mobile, it could perform uninterruptedly, a matter of the utmost importance in the seesaw desert battle. Communications, however, had proved to be a limiting factor in air operations, and there was always the troublesome problem of identification of friendly troops.<sup>60</sup>

In mid-August, when the British shook up their command in the Middle East, their army received two new general officers who were to prove as successful ground commanders as Coningham and Tedder were air commanders. Auchinleck had resisted Rommel's first assault on the Alamein line but had used up his own reinforcements in attempting to drive his adversary out of Egypt by an abortive series of attacks which he opened on 21 July.<sup>61</sup> The replacements were Gens. Harold L. Alexander, who took over the theater command, and Bernard L. Montgomery, who assumed command of the Eighth Army after the untimely death of Lt. Gen. W. H. E. Gott. Montgomery's influence was felt at once. The Eighth's morale improved with rest, with better rations, and upon the new commander's making clear that he planned no further retreats, that the battle for Egypt would be fought out at Alamein.



The rival forces recuperated during most of August, but it was universally appreciated that the Axis armies would mount another attack despite their numerical inferiority in men, tanks, and aircraft. The Nile was so close, they were so visibly losing the reinforcement race, and their commanders were believers in the tactical offensive. On 29 August the Axis troops were informed that in a matter of two or three days they would be in Alexandria, and just after midnight of 30/31 August the attack began. The result was the battle of Alam Halfa, named for a key hill in the British defenses.<sup>62</sup>

The main attack flowed around the Eighth Army's southern flank, the British withdrawing before it to ground of their own choosing. After the first day of the battle the RAF found continuous good flying conditions and thenceforth subjected the enemy concentrations to an almost uninterrupted pounding. The Axis intentions were plainly to draw the British armor from its prepared positions for a battle in the open, an honor which the British, with the tank trap at Knightsbridge fresh in their memory, firmly declined. The enemy accomplished nothing but the waste of his resources in futile attacks. USAMEAF aircraft were active in their several capacities. The heavy bombers scored a hit on a merchantman in a Mediterranean convoy while the B-25's attacked truck columns and the P-40's flew sweeps and escort.<sup>63</sup>

On 2 September the enemy exhibited reluctance to resume the offensive. The Eighth Army had already laid plans to restore the Alamein line and meanwhile had been carrying out harassing operations designed further to weaken the Axis battlefield supply position. On the night of 3/4 September the 2 New Zealand Division initiated action to close the mine-field gaps through which the attacking Axis columns had driven. The enemy fought stubbornly and, after pushing him back somewhat, Montgomery decided to break off, leaving the German-Italian forces a slice of the British mine fields for their trouble.<sup>64</sup>

A feature of the eight-day battle was the nonstop effort put forth by the RAF, which had switched its Wellingtons from attacks on ports to battlefield bombing. The total of Allied bombs dropped ran to 868 tons; over 3,500 sorties were carried out, to which the 12th and 57th Groups contributed 48 and "over 150," respectively. Coningham's fighters, moreover, finally destroyed the fearsome reputation of the Stuka, the Ju-87's jettisoning their bombs when the Allied pursuit approached. Despite a vastly larger number of bomber sorties, the RAF lost only seven bombers, the GAF and IAF, twenty-six. The fact

that the RAF lost forty-three fighters to the enemy's twenty-two was largely a reflection of the Hurricane's inferiority to the Me-109 and the Italian Mc-202.<sup>65</sup>

Alam Halfa, besides keeping the Axis out of Alexandria, gave rise to hopes that the answer to Rommel's tactics had at last been found. The British forces had not been committed piecemeal nor in the hitherto disastrous mobile tank actions, and the morale of the troops improved with success. Moreover, Montgomery had exhibited a lively appreciation of the role of air power in the land battle.<sup>66</sup>

For the Axis the supply situation had continued unsatisfactory, particularly in the category of petroleum products. Lack of aviation gas robbed the enemy of the full capabilities of his air force and, specifically, was thought by the British to have forced a four-day postponement of his Alam Halfa offensive. Lack of fuel and lubricants had slowed hostile tank movements and forfeited the advantage of surprise. By Middle East calculations, 100,000 gross registered tons of shipping made Axis ports in North Africa in August 1942; in the same month 80,000 were sunk by the efforts of the USAAF, the RAF, and the Royal Navy. Of the 80,000 tons, 40 per cent represented the handiwork of the air forces. The net cargo tonnage which the enemy received enabled him to improve his supply situation only slightly; he was sustaining but could not sensibly augment his forces, despite some improvement in September. With these statistics at hand, Montgomery was able to proceed methodically to develop his own offensive in the comfortable certainty that with each day the odds lengthened against his adversary.<sup>67</sup>

Malta, despite its perennial aviation fuel shortage, had been able to increase its exertions in the vital period when the opposing armies were building strength for further efforts. Its antishipping sorties were somewhat more numerous and its fighters even carried out some aggressive actions. But the Axis sea and air forces in the area, if not able to knock out the island, dealt violently with its reinforcement. From the heavily escorted supply convoy which passed Gibraltar eastwards on the night of 9/10 August, nine merchant vessels were lost plus the carrier *Eagle* and three other warships.<sup>68</sup> The loss of the *Eagle* directly affected the calculations for TORCH, which by then was in its initial planning stages.<sup>69</sup>

For the Egypt-based bombers, Tobruk and Bengasi remained lucrative targets, so vital that the Middle East forces even sent commandos

on a vain attempt to block their harbors on the night of 13/14 September. After Alam Halfa, the RAF turned the full weight of its mediums back on Tobruk, scarcely a night passing without twenty or thirty Wellingtons over the port; and when on 14 October three USAMEAF B-17's reportedly sank a lighter and hit a large motor vessel in its harbor, it had been already so badly mauled that Axis shipping had been largely diverted to Bengasi. The long-range bombers followed. A feature of the combined assault on Bengasi, of which the U.S. B-24's carried the brunt, was the raid of 22/23 September. The B-24's blew up an 8,000-ton ammunition ship lying alongside one of the main piers, the explosion appreciably reducing the harbor's unloading for several weeks.<sup>70</sup>

Strikes at shipping at sea and in ports to the north continued when reconnaissance picked up profitable targets. On 3 September an Axis convoy of three destroyer-escorted merchantmen was attacked in the Mediterranean by elements of the Royal Navy, the RAF, and the USAAF, and the one surviving merchantman was left ablaze.<sup>71</sup> A few days afterward, in Candia harbor, Crete, the 98th Group scored direct hits on a power station and left fires in the dock area.<sup>72</sup> The effectiveness of the naval and air campaign can be illustrated by the career of thirty tanks which were loaded for Africa in three shipments of ten each. One vessel was beached off Corfu, one was sent to the bottom, the third reached Bengasi only to be partially sunk in the harbor.<sup>73</sup> To reinforce his troops and maintain his supplies, particularly of fuel, the enemy used air transports, which flew down by night from Crete. By the end of October, when the Alamein battle was on, this traffic, maintained chiefly by Ju-52's, had precipitated a series of U.S. bomber raids on Maleme airdrome, whence the transports took off.<sup>74</sup>

On the administrative side, events of August and September 1942 put an end to the anomaly whereby a large number of officers and men fighting in the Middle East remained assigned to the Tenth Air Force. The Tenth's new commander, Brig. Gen. Clayton L. Bissell,<sup>75</sup> feeling keenly the loss of the key staff officers and combat crews who had gone to USAFIME in June and July, pressed for a clarification of their status.<sup>76</sup> The upshot was that Brereton was assigned to the Middle East on 16 September, as were the staff officers in question.<sup>77</sup> The Tenth Air Force had already got back most of its transports and it was arranged that it would also retrieve the greater part of the ground echelon which had originally accompanied its B-17's from India.<sup>78</sup>

A development of some importance in the career of USAMEAF manifested itself administratively on 12 October when orders were cut assigning nine officers to the IX Bomber Command, which organization was then and for a month afterwards unofficial. This command had its roots in a discussion on 5 September between Tedder's senior air staff officer, Air Vice Marshal H. E. P. Wigglesworth, and G-3 officers of USAMEAF, during which Wigglesworth asserted that he had control, delegated by Tedder, over the target selection for the U.S. heavy bombers. Col. Patrick W. Timberlake, G-3 of Brereton's staff, took a serious view of this assertion in that it violated the Arnold-Portal-Towers agreement that American combat units assigned to theaters of British strategic responsibility were to be organized in "homogeneous American formations" under the "strategic control" of the appropriate British commander in chief. In a memo of 7 September, Timberlake granted that this canon might be justifiably violated in the case of the 12th Bombardment (M) and 57th Fighter Groups, but he could see no reason why operational control of the 1st Provisional and 98th Groups, comprising four-fifths of the heavy bomber force in the Middle East, should not be vested in American hands. Subsequent negotiations carried the point with the British, who even turned over their 160 Squadron (Liberators) to the operational control of IX Bomber Command.

On 12 October a small staff moved into Grey Pillars, RAF headquarters at Cairo, and thenceforth USAMEAF's bombers operated only under the "strategic" direction of the British. Timberlake headed the organization, with Kalberer as his A-3 and Lt. Col. Donald M. Keiser as his chief of staff.<sup>79</sup>

### *El Alamein*

Now the time was ripening for the second British attempt to eject Rommel from his menacing proximity to the Delta, the first having been Auchinleck's July attacks. Across the thirty-two-mile neck between the Qattara Depression and the sea the Eighth Army faced Axis positions which were naturally stronger than its own and which had been considerably improved by three months and more of artifice. Triple belts of mine fields and defended localities were known to adorn the northern sector while the southern defenses, if not so formidable, were sited to canalize penetration. No practicable way offered to take this line in flank as it was anchored on the south by the forbidding

Qattara quicksands. Hard fighting into heavy defenses would be necessary before the customary desert mobility could be regained; in a long-drawn battle, however, it was expected that the enemy's disadvantageous supply position would tell against him.<sup>80</sup>

Montgomery's original conception envisioned strokes against both extremities of the fortifications, pushing the British armored divisions athwart the enemy supply line in the north and destroying the enemy armor in detail. His final plan was novel, if less ambitious. It preserved the multiple attack designed to keep the enemy armor dispersed, but contemplated as first priority the destruction of the enemy infantry while the British armor stood off the Panzers whose axes of approach would be restricted by their own mine fields. The offensive could not open before the full moon of 24 October, for, if semidarkness was required to clear a path through the enemy mine fields, some light was necessary for infantry operations.<sup>81</sup>

As early as 21 September, Coningham had outlined the air force's role in the impending operation to a meeting of all group captains and wing commanders. Stepped-up counter-air force action would commence 20 October to gain the high degree of air superiority without which Montgomery would not move. The enemy air dislocated, WDAF could intervene freely in the ground battle and, it was hoped, insure a certain initial tactical surprise by denying the enemy air reconnaissance. The period preceding 20 October was to be utilized in preparation—training and the repair of vehicles and of aircraft.<sup>82</sup>

Various administrative preparations were also put in hand by the RAF and USAAF. An advanced American air headquarters was attached to Advanced Air Headquarters, Western Desert, to gain experience in handling air forces in the field and to look out for American interests.<sup>83</sup> For instance, it was arranged that night missions by the B-25's could not be flown except in extreme emergencies without direct authorization of the commanding general of USAMEAF (four B-25's had been lost on a night mission against Sidi Hanaish airdrome on 13/14 September).<sup>84</sup> This American advanced headquarters became on 22 October the Desert Air Task Force Headquarters, with Brereton in direct command and Adler attached with the advanced headquarters of the service command. Chief of staff for the new organization was Brig. Gen. Aubrey C. Strickland, commander since 17 August of IX Fighter Command, who had arrived in the Middle East in July and overseen the training of the 57th Group. The Desert Air Task Force



continued under that name until February 1943 as the administrative control over the American units operating as an integral part of WDAF.<sup>85</sup> Although the arrangement did not conform to the terms of the Arnold-Portal-Towers agreement, the letter of that agreement could not have been efficiently applied in operations with WDAF, as the following battle assignments illustrate.

No. 211 Group, RAF, was prepared to go forward with the advance, and to its 239 Wing (Kittyhawks) the 57th Group's 66th Squadron was attached. The 66th, regarded as the best trained of the 57th's squadrons, all now ready for combat as units, arrived at LG 91 on 6 October. The 57th's other squadrons came under operational control of 212 Group, which had been set up to give WDAF a second fighter control formation, and continued to operate from LG 174 in conjunction with 233 Wing, RAF. The 12th Group with the addition of a Baltimore squadron made up 232 Wing and operated under the bomber control of 3 Wing (SAAF). In the middle of October the 12th's squadrons, reduced for mobility to essential operational strength, moved to LG 88, about fifty miles behind the front line, leaving administrative work to be done at the Delta bases.<sup>86</sup>

WDAF did not hesitate to interrupt training when opportunity offered for a blow at the opposing air force. Photo reconnaissance of 6-8 October revealed that the Axis forward landing grounds in the Daba and Qotaifya areas had been waterlogged by heavy rains. On the 9th, therefore, USAMEAF's B-25's contributed 16 sorties to a 292-sortie attack on the muddled-in aircraft of which 10 were assessed as destroyed and 22 damaged.<sup>87</sup>

Of the Axis air forces, the Italian Air Force, despite some recent aggressiveness with its Mc-202's, was not assessed as particularly formidable; it was disposed rearward to protect shipping. What was more, the condition of the Luftwaffe, disposed forward and expected to provide the main opposition, had fallen so low as to cause concern in Berlin. Maj. Gen. Adolf Galland, *General der Jagdflieger*,\* had flown into Fuka in September, interviewed Von Waldau, the commander, and looked over the situation. Kesselring was supposed to have resented Galland's inspection and, according to the latter's possibly apocryphal story, Goering dismissed as dummies half of the 800 aircraft

\* The duties of this headquarters position changed from time to time and with the incumbent. In fighter matters, Galland was variously adviser, consultant, administrator, inspector, formulator of doctrine, and operational authority.

shown to be on RAF fields. Rommel, not on good terms with his supporting air, neglected to ask for reinforcements until too late.<sup>88</sup>

Goering would have done better to have taken the photos seriously. On 16 October the RAF, ME had a total of 1,098 aircraft, of which 813 were in commission: 628 fighters, 383 bombers of all types, and 87 sea reconnaissance types. The USAAF could muster 56 P-40's, 46 B-25's, 10 B-17's, and 53 B-24's; of these were operational, respectively, 49, 35, 6, and 40. The Axis air forces, on the other hand, boasted only 218 Italian and 165 German fighters, about 150 bombers, 75 Italian CR-42 attack planes, and smaller numbers of seaplanes and reconnaissance aircraft. Serviceability was estimated at not over 50 per cent because of the severe shortage of materiel and spare parts. The Allied air forces, therefore, enjoyed superiority before the air offensive started, for which they could thank in part their own efforts against the German-Italian supply lines.<sup>89</sup>

On 19/20 October the preliminary air offensive began. Calls from the ground forces were answered, reconnaissance flown, M/T and artillery emplacements attacked, but the main emphasis was put on the destruction of the enemy air force: patrols were kept over its landing grounds which the bombers hammered day and night. At least 800 counter-air force sorties had been flown before the infantry moved to its assault positions on the night of 22/23 October, and as a result the British concentrations were not molested from the air at a time when the roads were clogged with their transport.<sup>90</sup>

The Eighth Army commanded such numerical and logistical superiority in all categories that it was appreciated that it could not fail to win if properly handled in the forthcoming battle. In manpower, it had almost a 2 to 1 advantage, 165,000 to 93,500, and if the quality of its troops was uneven the same could be said for the Axis. Of medium tanks the Eighth Army mustered 600 against 470 for the opposition; of guns of all types, 2,275 to 1,450. The German troops—15th and 21st Panzer Divisions, 90th Light and 164th Infantry Divisions, plus miscellaneous units—had been disposed so as to stiffen the Italian forces, which consisted, in the forward area, of six infantry and two armored divisions. In the forenoon of 23 October, Montgomery's message to his troops, "The Lord mighty in battle will give us the victory," was read to all hands and that night the battle got under way.<sup>91</sup>

The assault troops had spent the day of 23 October unobserved in trenches beyond the British forward positions. At 2140 hours massed

artillery opened on known locations of enemy batteries. Twenty minutes later the infantry started a westward trek that would lead it in time to Tunisia. In the important northern sector where two corridors were to be forced through the enemy defenses, substantial, if uneven, progress resulted from the first two days of fighting, but the British did not succeed in pushing their armor into the open.<sup>92</sup> They had undertaken elaborate deception measures to convince the enemy that the main assault would be in the southern sector and this delusion they fostered by heavy but costly attacks. On the 25th, Montgomery ordered the pressure in this area eased to preserve 7 Armoured Division's strength; as the division pinned down the 21st and Ariete armored divisions opposite, it was not, however, withdrawn. By that date the British tanks had got forward through the northern gaps and were in position to beat off and punish armored counterattacks. Behind this armored shield, Montgomery began the methodical destruction of the enemy infantry and cast about for a way to pass his tanks through to the Rahman area, key point of the enemy supply system. His drive, however, began to lose momentum in the deep enemy defenses, which contained in the north nine, not three, mine fields, and on the 26th he decided to regroup for further action.<sup>93</sup>

The hitherto comparatively inactive GAF and IAF apparently chose the 26th to challenge the Allied air. In this endeavor they lost by RAF calculations six Me-109's, eight Mc-202's, and three Ju-87's against Allied losses of four fighters. Moreover, an Axis ground concentration was prevented from forming for attack by the light-bomber shuttle service which the WDAF reserved for worthwhile targets and in which the B-25's joined.<sup>94</sup> The 57th Fighter Group was showing up well in battle: on the 26th its claims ran to four Mc-202's, and reports credited it with a like number of Me-109's the previous day. Predaylight of the 27th found the P-40's taking off by the glare of truck headlights for a surprise dawn fighter-bomber raid on one of the Fuka landing grounds, carried out at minimum altitude to avoid enemy radar detection, and later in the day a P-40 contingent came off victorious in a battle with assorted CR-42's, Ju-87's, Mc-202's, and Me-109's—the Italian fighter units involved admitted to four Mc-202's downed.<sup>95</sup> The main ground action on the 27th consisted of sharp attacks on Kidney Ridge by the 15th and 21st Panzer Divisions, the latter having come north during the previous night. These assaults were thrown back,



and on the 28th the WDAF light bombers and USAMEAF's B-25's succeeded in preventing preparations for their resumption.<sup>96</sup>

At this point Montgomery envisioned a breakout northward to the sea and a push along the coastal roads and railway to cripple the enemy's supply. Montgomery was now matching wits with Rommel, who had been in Berlin when the battle opened. That the Axis command no longer credited the feints in the southern sector had been demonstrated by the transfer of the 21st Panzer on the night of 26/27 October; accordingly, Montgomery moved his 7 Armoured north to promote designs of his own. On 28-29 October he attacked with 9 Australian Division, aiming to pinch off the coastal salient formed by earlier British gains in the north.<sup>97</sup> During the renewal of this attack on the 30th occurred one of the finest examples of tactical air force action in the whole campaign. The Australians were attempting to push their wedge to the coast. The air force shouldered the responsibility of preventing sizable counterattacks from Thompson's Post, within the enemy pocket to the east. Despite a bomb line that shifted constantly in an extremely restricted (nine-mile square) area, over 300 sorties were laid on, no sizable counterattacks developed, and none of the 95 tons of bombs fell on friendly troops.<sup>98</sup>

Rommel sensed that the Eighth Army now meant to concentrate on the coastal sector. He brought the weight of his German formations to bear, and fierce fighting resulted from his attempts to extricate the defenders of Thompson's Post. When on the morning of 29 October Montgomery learned that the famous 90th Light had moved into the Rahman area, he realized that the enemy had fathomed his intentions and so he changed his plans for the last time—for a drive against the Italians farther south which would break his 10 Corps (armored) into the open.<sup>99</sup>

The decisive phase of El Alamein then ensued. While Australian pressure on Thompson's Post evoked furious counterattacks, 2 New Zealand Division moved forward at 0100 hours on 2 November and cleared a new path across the Axis mine fields through which 9 Armoured Brigade had passed by first light. Although the brigade was subsequently severely punished by an antitank screen, 1 Armoured Division also came through and gave as good as it got in a savage tank battle near Tel el Aqqaqir. Behind the antitank screen the crumbling Axis forces began to withdraw along the coastal road. On the night of 3/4 November the infantry (including 4 Indian Division) turned the anti-

tank screen and let the British armor loose. El Alamein was over.<sup>100</sup> The air force was already scourging the traffic on the coastal road, over 400 sorties being delivered on the 3d.<sup>101</sup>

Montgomery hoped to cut off and destroy Rommel at Fuka or Matruh. On the 4th the rear guard stood briefly at Ghazal; by then the landing grounds east of Fuka were reported vacant. On the 5th there was a brief stand at Fuka escarpment, terminated after a short, sharp engagement. At this point, on the 7th, the rains characteristic of the season cheated Montgomery of his opportunity, immobilizing his armor's supporting M/T in the desert and miring WDAF on the newly occupied Daba landing grounds, on one of which A party of the 57th Group had already arrived. In the southern sector of the former Alamein line the air forces were dropping food and water to groups of prisoners which the Eighth Army had not had time to round up. Four Italian divisions had been entirely abandoned by the Germans.<sup>102</sup>

IX Bomber Command had not been inactive during the stubborn land battle. Besides its raids on Maleme, it combined with RAF Liberators and Beauforts to sink a tanker and a merchantman just off Tobruk harbor on the night of 25/26 October; these were the *Tergestia* and the *Proserpino*, which the Italians subsequently admitted were lost on this occasion. It sent five B-17's over Tobruk on 2 November to score hits on two medium-sized merchant vessels and start fires in harbor installations which were seen blazing two days later. Reflecting the rapid advance of the army, after 6 November no more USAAF heavy bombers went to Tobruk; Bengasi, and then Tripoli, became the principal targets.<sup>103</sup>

While Rommel was being cleared out of Egypt, the nomenclature of the American air forces in the Middle East was at last regularized. On 8 November, Lt. Gen. Frank M. Andrews took over the USAFIME command; an airman fresh from the Caribbean, where he had introduced a type of air force organization widely adopted by the overseas air forces, he was a logical choice to succeed Maxwell. On 12 November, by general order, he established the Ninth Air Force. On the same day, accordingly, Brereton was able to activate Headquarters Squadron, Ninth Air Force, and IX Air Service Command. IX Bomber Command was finally set up on 27 November, utilizing the Headquarters and Headquarters Squadron of the 19th Bombardment

Wing which had sailed into Port Tewfik on the *Mauretania* on 12 November.<sup>104</sup>

As all things are added to the victors, the Middle East's strategic objectives, which Brereton had stated back in August, grew suddenly nearer accomplishment with the flight of the Axis armies. On 15 November the Martuba airfields, beyond Tobruk and Gazala, were in the Eighth Army's hands, in time to cover a convoy which sailed next evening out of Port Said for Malta. No merchant vessels were lost on the passage. By then, IX Bomber Command's heavies had moved their bases from Palestine to the Delta; and on the night of 21 November, staging out of Gambut, they raided Tripoli. Moreover, on 8 November, TORCH had materialized on the beaches of Northwest Africa.<sup>105</sup>

## CHAPTER 2

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### *TORCH AND THE TWELFTH AIR FORCE*

WORLD WAR II was to see larger operations than the Anglo-American invasion of Northwest Africa, but none surpassed it in complexity, in daring—and the prominence of hazard involved—or in the degree of strategic surprise achieved. The most important attribute of TORCH, however, is the most obvious. It was the *first* fruit of the combined strategy. Once it had been undertaken, other great operations followed as its corollaries; competing strategies receded or went into abeyance until its course had been run. In short, the TORCH operation, and the lessons learned in Africa, imposed a pattern on the war.

America's military interest in Northwest Africa, as indeed its appreciation of the menacing trend of the European war, goes back to the collapse of the Allied armies in France and the Low Countries in the summer of 1940. The Germans adopted the ingenious plan of splitting France into two parts, allowing the more southerly to be governed by the aged Marshal Pétain at Vichy. The degree of independence exercised by Pétain was a moot question, but there was never any hindrance to the assumption of full control of France by the Germans, once they chose such a course.

North Africa, with those portions of the French Empire not declaring for De Gaulle, assumed a politico-military complexion similar to that of unoccupied France; and like Syria, Madagascar, and Indo-China, it eventually became a vacuum into which one or the other active military force would flow when circumstances proved suitable. Agents of both sides abounded in the area. The Axis, by the terms of the armistice with France, had left the Vichy French with African

forces considerable enough to maintain their ascendancy against internal revolt and to discourage a British invader; it kept a German-Italian armistice commission in North Africa. An Axis incursion in one form or another was appreciated as a constant possibility.

The strategic implications of the situation were important. To the United States, at uneasy peace, Nazi occupation of Vichy Africa would mean a threat to the Western Hemisphere from Dakar. For Great Britain it would mean the certain interdiction of the sea route through the Mediterranean, exposure of the sea route around Africa to attacks by U-boat and bomber, and a threat to the fledgling air route across central Africa to the Middle East. British or American operations in Northwest Africa were, therefore, in the first instance defensive, with the purpose of blocking the extension of Axis forces.

### *Genesis and Development of TORCH*

By August 1941 the United States had developed the joint plan JPB-BLACK<sup>1</sup> against the possibility of having to seize Dakar. Following Pearl Harbor, with the arrival of Churchill and his military and naval advisers, the so-called ARCADIA conference (23 December–14 January) was convened in Washington to refurbish and implement Anglo-American war plans. At this conference was presented GYMNAST, a plan which had been under study in the United States for some months, involving a landing at Casablanca. The British, for their part, had previously explored the feasibility of a landing on the Mediterranean coast of French Africa. These plans were combined as SUPER-GYMNAST, usually spoken of as simply GYMNAST. By 13 January 1942 the Combined Chiefs of Staff (CCS) had agreed that GYMNAST was the project of first strategic importance in the Atlantic area,<sup>2</sup> consonant with that part of the combined basic strategy which aimed to close and tighten the ring around Germany—a ring drawn from Archangel along the western coasts of Europe and the northern seaboard of the Mediterranean to Anatolia and the Black Sea.<sup>3</sup>

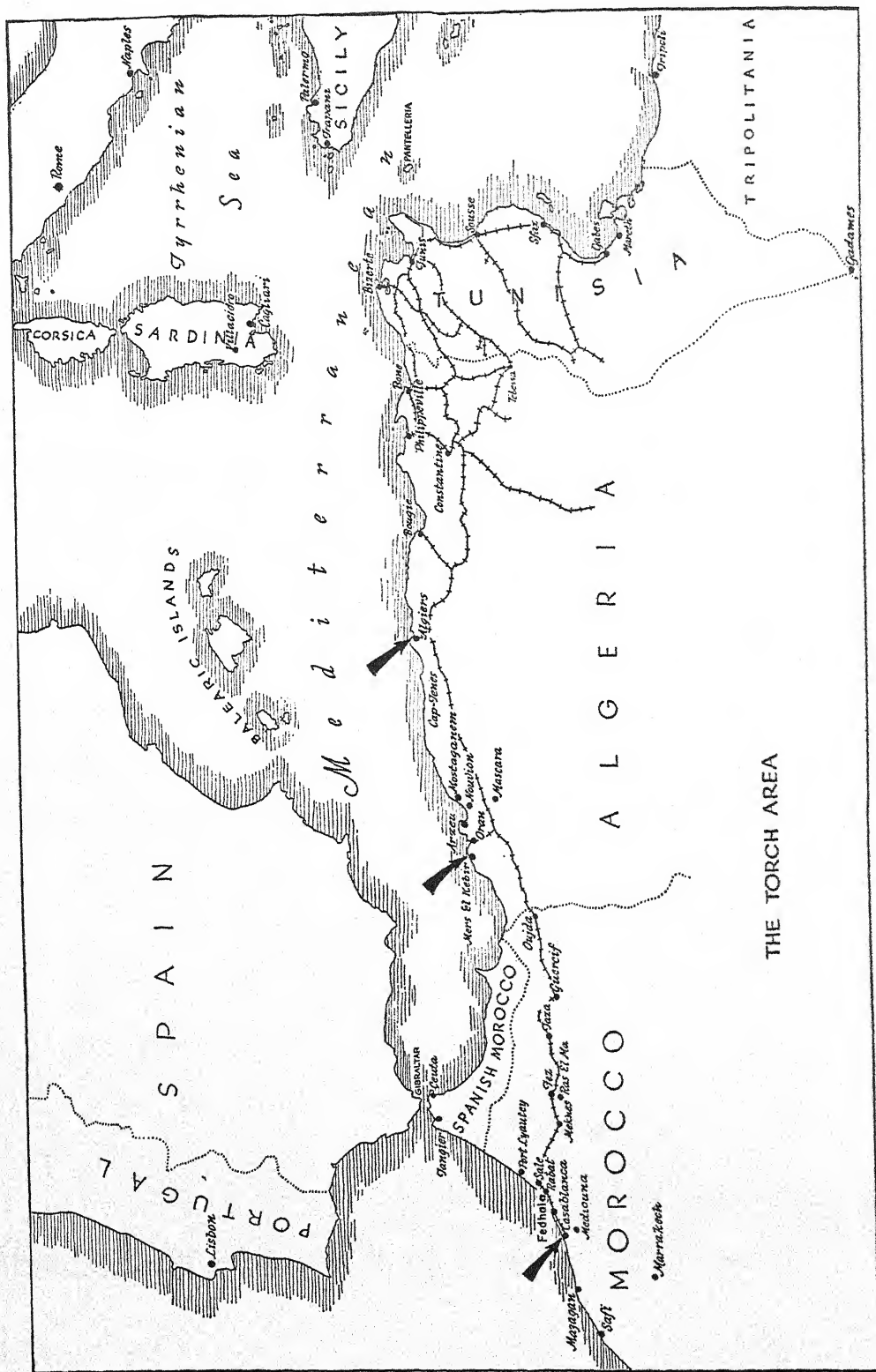
GYMNAST envisaged putting into French North Africa approximately 180,000 Allied troops, about equally divided between British and Americans. The Americans were to enter through Casablanca and the British either through Oran or Algiers, the plans changing somewhat in the latter regard.<sup>4</sup> From the lodgments in Morocco and Algeria, Allied control was to be extended over North Africa with an eye to the destruction of Rommel's forces, which were currently engaged

in the "accordion war" with the British, consisting of drive and counter-drive between Agheila, at the entrance to Tripolitania, and Gazala, beyond the Cyrenaican hump.<sup>5</sup>

GYMNAST offered the following advantages: providing a counter-move to a German entry into Spain; sealing off and neutralizing Dakar, thus accomplishing the principal objective of JPB-BLACK; forestalling Axis occupation of French North Africa; opening the Mediterranean to a limited degree; securing bases for land and air operations against Italy and for air attack on Germany if longer-range bombers became available.<sup>6</sup> The paucity of Allied shipping, however, effectively crippled GYMNAST: first, by limiting the size of the planned force and thereby forcing the planners to gamble; finally, by causing the enterprise to be altogether abandoned.

Because the Allies together could not transport in the initial convoys more than 24,000 men to Africa (13 January figures),<sup>7</sup> the operation had to be based on assumptions which were none too secure. Twenty-four thousand men could not break into French North Africa; therefore, the initial nonresistance and subsequent wholehearted co-operation of the French were essential. In fact, a French invitation was considered the *sine qua non* of GYMNAST, although the weight of British and American military opinion and of British civil opinion was extremely skeptical of the possibility of receiving a trustworthy invitation. Equally equivocal were the other major assumptions: (1) that Spanish resistance to a German incursion into Spain would delay for three months a German attack from Spain against Morocco; (2) that in case of a German invasion of Spain the garrisons in Spanish Morocco would admit the Allies. Moreover, if the line of communications through Gibraltar were cut, and it was anticipated that it would be, the Allied forces within the Mediterranean would have to be supplied and reinforced wholly through Casablanca and thence overland. In view of the limitations of Casablanca's port and the shortage of naval escort, it was estimated late in February that it would take six or seven months to land the entire force.<sup>8</sup>

A few of the other factors that plagued GYMNAST may be mentioned. It was not considered possible for an Allied army, beaten in Morocco and Algeria, upon its withdrawal to assault Dakar with any prospect of success.<sup>9</sup> Moreover, the expected early denial of the naval base at Gibraltar made possession of the Canaries essential, but if the Spanish did not acquiesce in their occupation, the Allies could





not immediately find the means to take the islands by force.<sup>10</sup> The GYMNAST commanders, who included at various times Lt. Gen. Joseph W. Stilwell and Maj. Gen. Lloyd Fredendall for the Americans and General Alexander for the British, had also to wrestle with the problem of combating the German and Italian air reaction with their own limited land-based aviation.<sup>11</sup>

Whatever the possibilities offered by GYMNAST, by late February 1942 it was recognized that the operation could not in any case be mounted, as a goodly part of the required shipping was far away in the Pacific.<sup>12</sup> On 3 March the Combined Staff Planners termed planning for GYMNAST an "academic study" and recommended that no forces be held in readiness for a North African expedition.<sup>13</sup>

By mid-April 1942, America and Great Britain had turned to and apparently agreed on a firm strategy for the extinction of the European Axis: cross-Channel invasion following a preparatory day-and-night air offensive.\* Target date for ROUNDUP, the full-scale adventure, was set for spring 1943, but provision existed for a lesser attack in the fall of 1942. The latter, designated SLEDGEHAMMER, was intended either to exploit a German setback or to ease German pressure on the Soviet front. The American forces needed to accomplish this cross-Channel strategy were set in motion towards the United Kingdom under a build-up plan coded BOLERO.<sup>14</sup>

The BOLERO-SLEDGEHAMMER-ROUNDUP strategy was at bottom an American conception, passionately cleaved to by the Joint Chiefs of Staff, which envisioned operating with overwhelming force against the European Axis in the logistically most-favored area. The major strategic decisions of June and July 1942 represented the progressive attrition and final eclipse of that strategy, principally by the hard fortunes of war in Libya and the U.S.S.R. together with the shortage of landing craft—to some degree by the British distaste for continental landings. The BOLERO concentration plan withstood the examination which resulted from Churchill's Washington visit in June, but a slightly different view was taken of its virtues. It was stressed that BOLERO was flexible enough to provide against any developments on the controlling eastern front: if the U.S.S.R. collapsed, England, the next threatened area, was reinforced; if the U.S.S.R. continued in the war, large-scale operations on the continent were possible out of the English concentration. Nor did it preclude the undertaking of GYMNAST or minor operations against the continent.<sup>15</sup>

\* See Vol. I, chap. 16.

This reaffirmation of the soundness of the BOLERO plan was accepted by the Combined Chiefs on 20 June. In the same paper, the GYMNAST operation, revived in Allied thinking by the prospect of encountering on the western front the major part of a Wehrmacht victorious in the east, was condemned because it depended upon uncertain political reactions and, opening a new front, it would spread the already strained Allied resources.<sup>16</sup> Pursuant to a White House conference on the 21st, however, it was directed that careful study be given to GYMNAST as an alternative to continental operations.<sup>17</sup> Marshall nevertheless commented on 29 June that the only diversions from BOLERO conceded in the June conferences were the American reinforcements to the Middle East, which amounted after all to speeding air reinforcements already contemplated.<sup>18</sup>

The feasibility of SLEDGEHAMMER, which by then had become a "sacrifice play" to aid the sorely beset Russians, was called in question by Churchill on 8 July.<sup>19</sup> The British had pointed out in June that the shortage of landing craft would limit to six divisions the initial force to be thrown on the continent; it was not thought that this would materially ease the pressure on the eastern front. The Americans, on the other hand, convinced that the collapse of the U.S.S.R. was the worst of all possible catastrophes threatening the United Nations at the moment, were inclined to assume risks. On 17 July, Marshall, King, and Harry Hopkins, among others, arrived in the United Kingdom to press the case for SLEDGEHAMMER.<sup>20</sup> On 22 July came the final British refusal, and two days later GYMNAST was in effect rehabilitated by the Combined Chiefs.<sup>21</sup>

The arrangements reached on 24 July were not altogether final. Matters stood as follows: the plan for ROUNDUP, the 1943 continental invasion, was to be pushed so long as there existed a reasonable chance of its successful execution before July 1943; if by 15 September 1942, Soviet deterioration made ROUNDUP impracticable, GYMNAST should be launched before 1 December 1942.<sup>22</sup> It was soon agreed, however, that the urgency of mounting TORCH, as GYMNAST had been renamed, before 1 December would not permit a delay until 15 September, when the outcome of the German campaign in the east supposedly would be apparent. At the Combined Chiefs' meeting on 30 July in Washington, Admiral Leahy stated that in his opinion the President and the Prime Minister had already cast the die for TORCH.<sup>23</sup> That evening at the White House, pre-

sumably on being put the question by Leahy, the President stated very positively that he, as commander in chief, had made the decision in favor of the African expedition.<sup>24</sup> Since the Prime Minister was a known partisan of Mediterranean operations, 30 July may be taken as the date when TORCH was definitely on. It may also be taken as the date on which large-scale cross-Channel operations were "in all probability"—to use the Combined Chiefs' phrasing—put off until 1944.<sup>25</sup>

In the few days during which ROUNDUP and TORCH were, on paper, alternatives, the latter had taken form rapidly. By 25 July the CCS had approved the command setup; to lessen French resistance TORCH was to have an American complexion, headed by an American commander with American troops as the first wave of the assault. Planning for the landings in Morocco was to be done in Washington, while London was to prepare the Mediterranean assaults.<sup>26</sup> By the 26th, Eisenhower, as commanding general of the European Theater of Operations, was definitely slated for the post of TORCH commander. Unfortunately, most of August was to be taken up by what he called a "transatlantic essay contest" as to the nature and even the feasibility of TORCH.<sup>27</sup>

The transatlantic essay contest was occasioned by a shortage of naval escorts, combat loaders, and aircraft carriers which threatened to reduce the striking forces that could be carried to Africa. The planners were forced then to consider the abandonment of one or another of the projected landings and found that with TORCH, unfortunately, abandoning any of the landings jeopardized the strategic success of the whole operation.

Eisenhower, who had commenced planning late in July, began on the theory of practically simultaneous assaults at Casablanca, at Oran, and in the region of Algiers; on 10 August he submitted informally to the British chiefs of staff a draft outline of TORCH agreeable to this conception.<sup>28</sup> Moreover, this general scheme was theoretically made binding by the CCS directive for TORCH, dated 13 August,<sup>29</sup> which required landings in the neighborhood of the three named ports and as far as practicable up the Algerian coast towards Tunis. At this juncture, however, the British and American navies insisted that it was impossible to escort convoys for operations within the Mediterranean and without (Casablanca) at the same time. Consequently, Eisenhower was compelled to shift his calculations. The securing of

Casablanca was left to a force backtracking overland from seized Oran. When word of this reached Marshall, he was disturbed enough to ask Eisenhower, on 15 August, for his completely frank estimate of the probable success of the operation; and when the Norfolk Group Plan, named for Eisenhower's planners at Norfolk House, reached Washington for presentation to the CCS, the central dilemma of TORCH received a thorough airing.<sup>30</sup>

The Norfolk Group Plan, in brief, differed from the CCS directive by omitting any landings on the Atlantic coast of French Morocco. Simultaneous predawn assaults were outlined at Oran, Algiers, and Bône, but of the thirteen divisions to be employed seven (American) were allotted to the tasks of cutting across to Casablanca and, subsequently, preparing for an attack on Spanish Morocco, should Spain find herself in the Axis camp. To provide additional insurance for the vital line of communications (LOC) through the Strait of Gibraltar, the plan indicated that studies were in progress for a further thrust at Spanish Morocco from the sea, to be mounted from England, if action were required before the Oran forces could consolidate on the landward side.

In light of later developments, there is interesting reasoning in the letter Eisenhower wrote under date of 23 August to explain the work of his planners.<sup>31</sup> He stated frankly that although he believed the Norfolk Group Plan made the best possible use of the resources available to him he did not believe those resources, however used, were sufficiently powerful to accomplish the tasks set forth by the CCS. If the French military, reported friendly to the Allies at Algiers and Bône but hostile in Tunisia and at Oran, resisted in determined fashion, there was little hope of gaining Tunisia overland ahead of the Axis forces—which once in Tunisia could be built up more rapidly than Allied armies. (After the fate of the August Malta convoy, it was appreciated that no assault convoy could sail directly for Bizerte or Tunis in the teeth of the Axis air forces in Sardinia and Sicily.) If the Spaniards moved against TORCH, an eventuality particularly likely if they were advised beforehand of the operation,<sup>32</sup> they could cut the LOC through Gibraltar and knock out the latter's naval base and airdrome. The Gibraltar airdrome, which was to be relied on heavily as a springboard from which land-based Allied fighters could be quickly passed into captured African fields, was at the mercy of emplaced Spanish artillery.

Personally, Eisenhower believed that if the two governments could find the resources a vigorous assault at Casablanca would greatly increase the chances of success.<sup>33</sup> As a demonstration of Allied power it would lessen the hazard of French resistance and Spanish intervention, more quickly establish an auxiliary land LOC, and aid in Allied deployment to thwart a German surge through Spain against the vital strait.

Whereupon, the two governments and their military staffs began the task of cutting the suit to fit the cloth. The U.S. chiefs of staff initially contended that if any landings were to be scrapped they should be those east of the Oran region, not those around Casablanca. The British chiefs, on the other hand, asserted that such an alteration would almost certainly deliver Tunisia to the Axis, and Tunisia was the key to Rommel's supplies. The British were particularly uneasy about the notorious weather of the Atlantic coast of Morocco, where, it was predicted, on four days out of five the surf would make amphibious operations impossible. Their readiness to forego the Casablanca landing indicated that they were willing to accept the risk as to whether Spain would remain neutral and defend her neutrality. The American chiefs of staff took no such optimistic view, insisting that the line of communications be made secure by an Allied thrust at Casablanca.

The controversy lasted into the first week of September and was finally settled after the intervention of the two chiefs of state, both eager that TORCH be undertaken. According to one account, Roosevelt was willing to dispense with British assistance, except for RAF and Royal Navy contingents, and indorsed the capture of Casablanca and Oran with an "All-American" team, so anxious were he and Marshall that American troops gain combat experience in 1942. By 6 September the TORCH design had hardened. A few days later Eisenhower and his chief of staff were puzzling over another question—this one of an enigmatic quality: what was to be the Anglo-American strategy after TORCH?<sup>34</sup>

The TORCH outline plan appeared on 20 September.<sup>35</sup> It was identical in salient points with the CCS directive of 13 August and preserved the old GYMNAST conception whereby British forces predominated east of Oran and American in the western Algerian and Moroccan operations. Three task forces were initially to descend on French North Africa—D-day, 8 November. The Eastern Assault

Force, mixed British and American and staging out of England, was to take Algiers, whereupon the British First Army would be brought in to secure Tunisia and operate eastward against Rommel. American troops of the Center (Oran) Task Force, also sailing from England, and the Western (Casablanca) Task Force, sailing from the United States, were to link after the attainment of their initial objectives and prepare, as the Fifth Army,<sup>36</sup> for a possible thrust into Spanish Morocco. A feature of the Norfolk Group Plan was preserved by the organization in England of a Northern Task Force with the mission of attacking the Tangier-Ceuta area before D plus 60, should action be required before the Western and Center task forces could be readied.<sup>37</sup> The organization of this force was begun by General Eisenhower in late October,<sup>38</sup> on 4 November the CCS approved the plans,<sup>39</sup> and under the code name BACKBONE the project was active until 6 February 1943.<sup>40</sup>

All things considered, the TORCH operation was the purest gamble America and Britain undertook during the war, largely because success depended so greatly on political rather than military assumptions. In this connection, security transcended its ordinary importance, for its breach threatened to convert into active enemies substantial forces in Spain and Africa which might acquiesce if surprised. No certainty would exist that the secret had been kept before TORCH had been irrevocably committed; no preliminary bombardment would soften the African beaches; the risk of trap or ambush was considerable. No one could guarantee, in view of the special hazards of the coast of Morocco, that the important Western Task Force would hit the beaches within a fortnight after the Algerian landings had taken place; elaborate alternate plans had to be prepared for that armada.<sup>41</sup> TORCH, unlike GYMNAST, was prepared to fight its way ashore, yet it could not afford prolonged French resistance if it was to keep its date with Tunis and Bizerte. Probably the greatest weakness of the plan, however, was that it faced both east and west, Spanish Morocco and Tunisia. That weakness had cost three weeks of precious time in the planning days of August; later, some thought it cost Tunisia.<sup>42</sup>

### *Organization of the Twelfth Air Force*

It had been obvious from the outset that the preponderance of American strength for the invasion of North Africa had to be found from resources previously allotted to the general purpose of cross-



Channel invasion. In terms of air force deployment, this meant that Maj. Gen. Carl Spaatz' Eighth Air Force, then preparing to test the American doctrine of high-altitude, precision daylight bombing from the United Kingdom,\* would furnish the core of the air striking force for TORCH.<sup>43</sup> The Eighth began by furnishing the commander. General Doolittle had been assigned, after his Tokyo raid, to ready the 4th Bombardment Wing (M) for service with the Eighth; on 30 July, Marshall and Arnold agreed that he would head the USAAF contingent for TORCH, subject to the approval of Eisenhower and Spaatz. Their approval being forthcoming, Doolittle arrived in England on 6 August to take up his considerable task.<sup>44</sup>

The Eighth not only held the principal AAF resources at hand for service in Africa but its personnel, albeit in August 1942 with almost no combat experience, were the most highly trained available. Eisenhower, after conferences with Doolittle and Spaatz, built his plan around that fact; on 13 August he announced that he meant to build the TORCH air force around a nucleus taken from the Eighth with additional units drawn directly from the United States.<sup>45</sup> Utilization of Eighth Air Force heavies and fighters would capitalize on the superior training of their crews. Medium and light bomber units previously scheduled for the Eighth would proceed to England for indoctrination, processing, and most important, initiation into combat; moreover, the Eighth would be able to furnish experienced personnel for key positions in the fighter, bomber, and service commands.

The initial combat force comprised two heavy bombardment groups, two P-38 and two Spitfire fighter groups, one light and three medium bombardment groups, and one troop carrier group. The plan was sound and appeared workable, but as it happened it presumed too much on the readiness of the medium and light groups; furthermore, because of weather and the haste of mounting TORCH even some of the Eighth Air Force groups already in England in August did not get the amount of combat experience which might have been reasonably expected in the interval before the African campaign began.<sup>46</sup>

The impact of TORCH on USAAF resources was revealed when the Plans Division of the Air Staff reviewed the possibilities of furnishing the units required to complete the air task force, which units Eisenhower desired in England by 15 September.<sup>47</sup> The heavy bombardment and fighter groups, already in the United Kingdom, presented no

\* See Vol. I, chaps. 17 and 18.



problem, but the equipment of the medium and light bombardment groups was far from complete, and headquarters units for fighter, bomber, and service commands would have to be furnished by those in training for the Ninth Air Force. Similarly, the complement of signal companies (aviation) and signal construction battalions could be made up only at the price of diversions from the South Pacific. The assistant chief of Air Staff, Plans emphasized that the satisfaction of Eisenhower's requirements entailed the utilization of partially trained personnel in many categories. The mid-September deadline could in no case be met.<sup>48</sup>

The plan meanwhile went forward in England where, by 18 August, the Eighth had been charged with the organization, training, and planning of the new air force, whose code name, appropriately enough, became JUNIOR; Doolittle, for the time being in the capacity of a staff officer of the Eighth, became directly responsible to Spaatz for these functions. Headquarters of the Eighth Air Force and its bomber, fighter, and service commands were each to sponsor the creation of a corresponding organization for JUNIOR.<sup>49</sup> Most of the Twelfth's commands, however, were activated in the United States, from units previously designated for Brereton, and then shipped to England. Headquarters and Headquarters Squadron, Twelfth Air Force, came into existence at Bolling Field, D.C., on 20 August. XII Fighter Command was activated at Drew Field, Florida, on the 24th and XII Air Force Service Command at MacDill Field, Florida, two days later. All three organizations were rushed across on the *Queen Mary*, which sailed from New York on 5 September, and were attached to their opposite numbers in the Eighth. XII Bomber Command was activated at Camp Lynn, High Wycombe, on 2 September by order of General Spaatz, its personnel being drawn from VIII Bomber Command and, later, from 4th Bombardment Wing.<sup>50</sup>

On 8 September, Spaatz announced to his staff that JUNIOR would soon be organized as a proper air force. Thereafter the Twelfth took shape rapidly, receiving its initial assignment of tactical and service units from the Eighth four days later.<sup>51</sup> On the 23d, Doolittle assumed command and announced Col. Hoyt S. Vandenberg as his chief of staff. Definite assignments to the subordinate commands followed on the 27th: Col. Claude E. Duncan to XII Bomber Command, Col. Thomas W. Blackburn to XII Fighter Command, and Brig. Gen. Delmar Dunton to XII AFSC.<sup>52</sup>

The air force requirements which Eisenhower had outlined on 13 August<sup>53</sup> were evidently predicated on the Norfolk Group Plan<sup>54</sup> which omitted the assault on Casablanca, for on 1 September, Doolittle, once more in Washington, met with Arnold and they proceeded to initiate the organization of a second U.S. air task force, which would cooperate with General Patton's troops striking at the west coast port. What was planned was in effect another full-scale air force with bomber and fighter wings instead of bomber and fighter commands.<sup>55</sup> Although it was afterwards reduced, its paper strength was initially as great as that of the Twelfth Air Force proper,<sup>56</sup> which was designed to function in an equivalent role at the Oran landings.

After his meeting with Arnold, Doolittle radioed Vandenberg that he was staying in the States until the new organization got under way. XII Ground-Air Support Command was activated from the former headquarters and staff of III Ground-Air Support Command on 17 September; its name was shortened to XII Air Support Command (ASC)\* by redesignation on 1 October. By then Brig. Gen. John K. Cannon had succeeded Col. Rosenham Beam as its commander.<sup>57</sup> Of necessity the command was very hastily organized, though only a little more so than had been TORCH itself, and one mistake occurred in the tardy provision of a service command detachment. Not until 4 October was the Detachment, XII Air Force Service Command, activated, of which Col. Harold A. Bartron became head.<sup>58</sup>

The TORCH air plan, issued 20 September, reflected the central weakness of the entire operation. Although Eisenhower had a naval commander—Admiral Cunningham, with a brilliant record in the Middle East—and had wanted an air force commander, Allied Force ended with two separate air commands. These commands were separate as to nationality, tasks, and areas of responsibility and operations, corresponding in general to the projected division of the ground forces into the American Fifth and the British First Armies. They were directly responsible to Eisenhower, whose staff included an assistant and deputy assistant chief of staff for air, Air Cdre. A. P. M. Sanders and Brig. Gen. Howard A. Craig, to “coordinate” air planning. With Allied Force Headquarters, or AFHQ as it was generally known, then, lay the responsibilities of reinforcing one command from another as need arose and of insuring centralized direction of the air protection for convoys. Whatever ensued, the

\* Not to be confused with Air Service Command.

naval commander could not be expected to negotiate separately with each air command.<sup>59</sup>

The British components of the TORCH air force comprised the Eastern Air Command (EAC) under Air Marshal Sir William Welsh. Welsh drew the definite assignment of cooperating with the Eastern Assault Force and the Eastern Task Force (First Army) in the seizure of Algiers and the subsequent advance to Tunis and beyond. His fighters were responsible for the air defense of the Mediterranean coast line eastward from Cap Ténès, 100 miles west of EAC's prospective headquarters at Algiers, and he was vested with the task of making arrangements for land-based air cooperation with the navies. Welsh was also the middleman for Eisenhower's relations with the RAF outside North Africa—with the Air Ministry and the AOC-in-C Middle East. If urgent help from Malta were required, it was further provided that AFHQ, through Welsh, could communicate directly with RAF, Malta, simultaneously notifying the Middle East. Such arrangements were part of the generally loose integration of the Allied Force in Northwest Africa with the Middle East command.<sup>60</sup>

Doolittle's Twelfth Air Force was almost three times as large as the Eastern Air Command (1,244 to 454 aircraft).<sup>61</sup> Its role, after the assault phase, was by no means as clear, Spaatz being constrained to remark to Doolittle on 30 October that he had never understood "what, when, and where" the Twelfth was to do.<sup>62</sup> Should the Western and Center task forces move on Spanish Morocco, the Twelfth would support their operations.<sup>63</sup> Should BACKBONE land near Tangier, the Twelfth was in support.<sup>64</sup> Should the Germans begin penetration of Spain, the Twelfth's B-17's—based at the Oran airdromes—would strike the peninsula.<sup>65</sup> Plans had, of course, been laid to move the Twelfth eastward for operations against Rommel or for an air offensive against Italy, but such a movement had to wait on the clearing of Tunisia and, to some extent, on the clarification of Allied strategy.<sup>66</sup>

During the assault phase of TORCH, Doolittle was to remain with Eisenhower at the command post in the tunnels of Gibraltar while his Air Corps units at Oran functioned under his A-3, Col. Lauris Norstad, and the XII Air Support Command operated at Casablanca under Cannon, both directly responsible to the ground commanders of the respective task forces. Doolittle would subsequently establish his headquarters at Oran and take over command, first, of Norstad's force, then of XII ASC, and await Eisenhower's directive for the

further employment of the Twelfth. The actual landings in Africa were to proceed, in the first instance, with the support of carrier-borne naval aviation until the capture of airdromes permitted operations by the Eastern Air Command and the Twelfth.<sup>67</sup>

Not only was a great weight of Allied air power to be brought to bear in the actions against the three ports—to give the French defenders the impression of *force majeure* under which they could honorably lay down their arms—but AFHQ hoped afterward to meet enemy air reaction on a strength basis of two to one. Nevertheless, the rate of build-up was subject, during the early days when the heavy losses were to be expected, to well-defined limitations. First of all, airdromes had to be captured, and the total French African airdrome resources were far from adequate. If Gibraltar were subjected to heavy and persistent Axis air attack, great execution could be wrought among the short-range Spitfires and Hurricanes being erected there for flight to the theater. The employment of all types of aircraft, whether moving to Africa by ship or under their own power, was limited, of course, in the logistical situation by what supplies could be brought in the early convoys, unloaded at possibly damaged ports, and transported over the limited African road and rail network. The Eastern Air Command faced a nice problem in this regard: it had to be heavy with motor transport to insure its mobility in the dash for Tunis, but the bulky motor transport cut into the number of squadrons which could be employed—precisely in the region where the heaviest Axis air reaction, from Sardinia and Sicily, could be expected.<sup>68</sup>

Tied in with the vast TORCH design were the RAF home commands and the Eighth Air Force. Specifically the Eighth was directed to strike the submarine pens on the Biscay coast, with the object of easing the passage of the TORCH convoys, and with a vigorous air offensive to pin the GAF in northwest Europe.<sup>69</sup> Air reinforcement of Africa was always possible out of either United Kingdom or Middle East resources, the limitation here being whether Eisenhower, with his straitened maintenance, could profitably utilize additional squadrons.<sup>70</sup> He had stated, however, that if necessary to the success of his enterprise he would use the whole of the Eighth Air Force in TORCH,<sup>71</sup> and two of the Eighth's heavy groups (91st and 303d) were earmarked for service in Africa; as well, the P-38's of the 78th Group were to be held in England as a general fighter reserve.<sup>72</sup>

The tactical plans for the landings assigned the Twelfth Air Force

important roles at both Oran and Casablanca. The original arrangements for Oran called for the dropping of parachutists by the 60th Troop Carrier Group at the two most important airdromes in the vicinity—at La Senia to destroy the French aircraft concentrated there and at Tafaraoui to hold its paved runway until relieved by troops from beachheads east and west of the city. With Tafaraoui in American hands, USAAF Spitfires waiting at Gibraltar were to fly in upon call from the Oran air task force commander on board the Center Task Force headquarters ship.<sup>73</sup>

Air Corps troops arriving in the Oran region on D-day and in subsequent convoys were to prepare for the reception of additional units flying in from England. Detailed schedules were drawn up for aircraft movement but were not in the end adhered to—because of lack of readiness in the case of some units and on account of tactical considerations with others.<sup>74</sup> According to plans of 4 October, prior to the time they would be consolidated with the Morocco-based XII Air Support Command, the units flown into the Oran area would comprise up to four fighter groups under XII Fighter Command and up to one light, two medium, and four heavy bombing groups under XII Bomber Command.<sup>75</sup> AFHQ indicated that once the French in Morocco had been subdued, the Oran area might expect additional fighter reinforcements from XII ASC, in view of the greater likelihood of GAF or IAF reaction on the northern coast. The heavy bombers were to be based in the Oran area on the theory that they could be used against either Spain or Tunisia.<sup>76</sup> The plans, however, which underwent the many inevitable changes, at one time indicated that two heavy groups might also go to General Cannon.<sup>77</sup>

The use of paratroops constituted a vital part of Allied Force's arrangements for prompt seizure of Algeria and the subsequent dash to Tunisia, and two of the three groups in Col. Paul L. Williams' 51st Troop Carrier Wing were assigned for lift. The 60th, charged with the operations at Oran, was organized on 12 September with Col. Edson D. Raff's 2d Battalion, 503d U.S. Parachute Infantry, into the Paratroop Task Force under Col. William C. Bentley, Jr., familiar with the African area by reason of his former post of military and air attaché at Tangier. Jump-off points for the operation had to be as close as possible to the objective, for a trip of over 1,200 miles was in prospect: the fields at St. Eval and Predannack in Cornwall were chosen on this account. The Paratroop Task Force arranged to home

on Royal Navy warships in the assault fleet and on a radio which an American operative was to smuggle ashore.<sup>78</sup>

The 64th Group was to furnish lift for 400 men—two parachute company groups of the British 3 Paratroop Battalion—the plan evidently being to fly them into Algiers after its capture and then jump them at points farther east. The planes and passengers were to be assembled at Hurn in Cornwall for a D-day take-off.<sup>79</sup> Patton had asked that paratroops from England also be used in his operations in French Morocco, against the Rabat airfield and later, as his assault plans changed, against the Port Lyautey airfield, but Eisenhower rejected his plea for various reasons, among which was the fact that a definite day for the Moroccan landings could not be set. The enterprise was abandoned early in October.<sup>80</sup>

The employment of Colonel Bentley's Paratroop Task Force underwent a change after Maj. Gen. Mark W. Clark's famous submarine visit to Africa in the third week of October, during which Brig. Gen. Charles Mast and other pro-Allied Frenchmen assured Clark and Robert Murphy that American troop carrier aircraft could land unopposed at Oran airdromes and that French forces in the Bône area would offer no resistance. As these assurances offered the attractive opportunity of a rapid Allied movement toward the east, AFHQ prepared to exploit the situation. Alternate plans were drawn: "war" plan which assumed French resistance and provided for a night drop at H-hour, D-day, to capture the airdromes; and "peace" plan by which the planes were to be welcomed at La Senia during daylight on D-day and be immediately available for operations eastward. On D minus 1, Eisenhower would communicate from Gibraltar the decision as to which plan was to be used.<sup>81</sup>

Back in July, Sir Charles Portal had remarked that the projected Casablanca landings might be assisted from Gibraltar, where, as he put it, the presence of British aircraft would raise less suspicion of "impending operations in the neighborhood."<sup>82</sup> It was determined in September that 220 fighters—130 AAF Spits and 90 RAF Spits and Hurricanes—could be erected, tested, and passed through to captured African airdromes by D plus 2, and the D-day arrangements provided that they could be sent to Oran, Algiers, or Casablanca, the decision, again, to be made by AFHQ in accordance with the tactical situation. To service any Spitfires which might be dispatched to the Western Task Force area, sixteen mechanics from the U.S. 31st Fighter Group



were sent to the United States from England and subsequently sailed back across the Atlantic with Patton's force. The ground echelons of the 31st and 52d U.S. Spitfire groups were to come in with the Oran convoy. All the pilots, USAAF and RAF, left Glasgow on the same boat and debarked at Gibraltar on the night of 5/6 November.<sup>83</sup>

USAAF participation in the assault on the Casablanca area hinged largely on the seizure of the Port Lyautey airdrome, to which the P-40's of the 33d Group would be flown after being catapulted from an auxiliary aircraft carrier accompanying the assault convoy. Air Corps troops of XII Air Support Command, coming in with the ground forces on D-day, would act in the first instance as assault troops and, as additional airdromes were captured, prepare them for operation and the reception of additional units; as many as three fighter groups, two medium bombardment groups, and one of light bombardment might arrive.<sup>84</sup> The Port Lyautey field, with its hard-surfaced runways, ranked as the most valuable by far in the area. It constituted the main objective of subtask force GOALPOST, landing at the mouth of the shallow, winding Sebou River. Not without difficulty, the authorities at Newport News finally provided a vessel drawing little enough water to negotiate the Sebou with a cargo of gasoline, oil, and bombs for the Port Lyautey field: the *Contessa*, an old 5,500-ton fruit boat.<sup>85</sup>

It had taken a decision by the CCS (19 September) to assign the 33d Group to the Twelfth Air Force,\* and other hurdles had to be surmounted before the group finally sailed for Africa. The U.S. Navy was suffering from a shortage of carriers for its own role in the Casablanca assault and begrudged the use of a flattop for fighters whose employment might be frustrated if GOALPOST encountered difficulty ashore. Polite doubts were voiced as to whether P-40F's could stand the strain of catapulting. The Navy, however, cooperated by training Army pilots at the naval aircraft factory at Philadelphia and assigned the *Chenango* to carry the group to Africa.<sup>86</sup> As advance replacements for the 33d, thirty-five planes and pilots sailed in the British auxiliary carrier *Archer* on the first follow-up convoy to Morocco.<sup>87</sup>

The Twelfth Air Force, on the eve of its commitment to TORCH, was a very unevenly trained command, especially in regard to signal units, as Doolittle pointed out in a progress report to Eisenhower on

\* See above, p. 25.



4 October (later, on 21 December, he estimated that "at least" 75 per cent of his air force's personnel had been either untrained or partially trained). Allowances were made for this fact in the plans. Doolittle meant to commit his best-trained combat units first and continue operational training in the theater; moreover, the TORCH air plans provided against an anticipated greater rate of aircraft wastage for the American flyers.<sup>88</sup> In point of training and experience the Twelfth's combat units could be divided into rough categories: those Eighth Air Force units which had already arrived in England before being assigned to the Twelfth; those units intended for the Eighth but diverted to TORCH before arrival in the theater; and those specifically activated for TORCH or assigned to it in the United States.

In the first category lay a number of units which bore the brunt of the early air fighting in North Africa: the 97th and 301st Bombardment Groups (H); the 31st and 52d (Spitfires) and 1st and 14th (P-38's) Fighter Groups; and the 15th Bombardment Squadron (L). The heavy groups were the pioneers of daylight precision bombing in the European theater and had run a goodly number of missions before they began packing up for TORCH.<sup>89</sup> Of the Spitfire groups, only the 31st had had significant combat experience, notably on the Dieppe raid in August; however, both had trained with the RAF.<sup>90</sup> One of the 1st Group's squadrons had been stationed for a time in Iceland, but despite the best efforts of the Eighth Air Force, egged on by impatient communications from Arnold, it had been impossible to introduce the P-38 to combat. On the eve of TORCH, except for tests against a captured FW-190, there was no indication of how the P-38 would stand up to the Luftwaffe.<sup>91</sup> The 15th had been sent to England with the intention of converting it to a night fighter squadron. When the plan was abandoned, its DB-7's began operating as light bombardment under the aegis of VIII Bomber Command and had several missions against occupied Europe to their credit.<sup>92</sup>

The difficulties in readying the medium and the rest of the light bombardment for TORCH proved considerably greater than had been anticipated, even by the gloomy initial estimate AC/AS, Plans had prepared in August.<sup>93</sup> It was intended that the original four groups—three medium and one light—fly to England across the North Atlantic ferry route, Presque Isle, Goose Bay, BLUIE (Greenland), and Reykjavik. Those echelons which got off during September or early October negotiated the route without great trouble; thereafter weather

marooned increasing numbers of aircraft. The 310th Group (B-25's) managed fairly well, but the 319th Group, which had been unduly delayed waiting for its B-26's at Baer Field, Indiana, and the 47th Group (A-20's) left planes and equipment strewn all along the route and experienced some casualties. Under these circumstances the "training and initiation into combat" from England mentioned by the August plans was impossible. The northern route was finally closed to twin-engine aircraft and the remaining mediums allocated to the Twelfth—the 17th and 320th (B-26's) and the 321st (B-25's)—eventually came by way of the southern ferry route.<sup>94</sup>

Ill fortune also dogged the P-39 components of the Twelfth—two squadrons of the 68th Observation Group and the 81st and 350th Fighter Groups. Their aircraft, diverted from a Soviet consignment, were of the P-39D-1 and P-400 vintage, types currently proving inferior against the Japanese in the Solomons. VIII Air Force Service Command, without spare parts or mechanics familiar therewith, lagged far behind the schedule for their erection and modification, and pilot training was hence foreshortened. Moreover, when the comparatively short-range P-39's began moving to TORCH in December and January, a large number were grounded, chiefly in Portugal, by reason of contrary winds and mechanical failure and were interned.<sup>95</sup> The successive difficulties encountered in the training and preparation of its medium and P-39 squadrons help to explain why several months passed before the Twelfth was able to deploy in Africa anything resembling its assigned strength. It was planned that most of the TORCH aircraft would proceed to Africa from England under their own power. Because of the magnitude of the fly-out and the fact that USAAF and RAF participation would make a coordinated program necessary, overall plans were set forth by AFHQ late in October. The movement was based on a group of airdromes in southwest England under control of 44 Group, RAF.<sup>96</sup>

### *The Theater Air Force*

The rehabilitation in London in July 1942 of the GYMNAST conception was not at the insistence of American strategists. Marshall had distrusted the African operation; Eisenhower, who was charged with carrying it out, reportedly considered 22 July, when SLEDGEHAMMER had been scuttled and the British made the proposals which resulted in TORCH, as a candidate for "the blackest day in history."<sup>97</sup>

Adm. Ernest J. King worried over the effect on the Pacific war of TORCH's requirements in shipping, escorts, and carriers.<sup>98</sup> For a number of reasons, the USAAF shared this general lack of enthusiasm.

In the first place, although the strategic air offensive against Germany, which the AAF regarded as its main European objective, was not a project strictly contingent upon the BOLERO-ROUNDUP strategy, as U.S. Navy sources later alleged,<sup>99</sup> it had enjoyed an unimpeachable status so long as ROUNDUP remained the No. 1 Anglo-American effort. When TORCH was erected, formally, into an alternative to ROUNDUP on 24 July, the Eighth fell from the first priority position among the air forces; its heavy and medium units were designated as "available" for TORCH, and fifteen combat groups formerly destined for England were diverted to the Pacific.<sup>100</sup> Potentially more ominous was the fact that U.S. Navy quarters began to hail the eclipse of ROUNDUP as implying a more thoroughgoing shift in strategy—towards an offensive against Japan.<sup>101</sup> In these circumstances, the contemporaneous CCS assurance that resources would be made available to the RAF and the USAAF for a "constantly increasing intensity of air attack"<sup>102</sup> on Germany left something to be desired.

If TORCH had certain deficiencies from the point of view of over-all AAF strategy, it was nevertheless preferable to any reorientation of Allied strategy towards the Pacific or to any diversion of AAF units thereto; for with TORCH, AAF units at least moved, geographically, in the right direction, and since there was no predetermined Allied strategy for the post-TORCH period,<sup>103</sup> any suitable air resources which could be got to the European theater might in the end find their way into the air offensive against Germany. TORCH was, after all, an approved operation, entitled to the best efforts of all the services; it was not long before USAAF headquarters at Washington perceived that the overriding priority accorded the African venture logically extended to organizations in general support of TORCH, i.e., the Eighth Air Force—and that by embracing the lesser evil the greater might be mitigated.

Thus, when on 20 August, Admiral King called for the air units promised by the CCS at London—which units the admiral planned to use in the Pacific—General Arnold countered with a memorandum setting forth the superior claims of Africa.<sup>104</sup> Warning that to disperse air resources meant wasting them, he stated that TORCH, combined of course with a bombing offensive out of England, alone of the pend-

ing Allied operations gave promise of decisive results. In his opinion, as the first Anglo-American offensive and an extremely hazardous one, it should be supported with all available resources; instead, he found that insufficient air forces had been assigned. The aircraft strength assigned to TORCH was not adequate for any of its phases: the landings, the conquest of the area, or the subsequent bomber effort from African bases, which Arnold felt to be necessary if the operation was to be exploited as a genuine offensive. His policy of building a formidable air force for Africa evidently bore fruit within a fortnight, when, with Doolittle, he organized XII Air Support Command.

By the end of August, the Eighth Air Force was preparing the Twelfth as a matter of first priority and clearly getting more and more involved in TORCH.<sup>105</sup> Spaatz successfully protested Eisenhower's orders that the Eighth, better to help with the African preparations, cease operations entirely,<sup>106</sup> but he realized that the endeavor to reopen the Mediterranean might "suck in" his whole combat establishment.<sup>107</sup> Eisenhower was backing Spaatz' requests for greater strength, but primarily on the ground that the Eighth could both furnish convenient short-term reinforcements for Africa and conduct intensive operations to fix the GAF in northwestern Europe.<sup>108</sup> The TORCH commander's power and expressed intention to use all of the Eighth in Africa if necessary made the choice of his air advisers or air commanders vital for the AAF.<sup>109</sup> Under the TORCH design, well formed by this time, the commander in chief had no over-all air commander.

Eisenhower's indorsement of Spaatz' arguments for reinforcing the Eighth strengthened General Arnold's position. He used it to support a memo of 10 September<sup>110</sup> to the Joint Chiefs, in which he advanced as a fundamental principle that TORCH could not stand alone, that the operations in the Middle East and the United Kingdom were complementary to it in that they drew off the Luftwaffe. He warned that the North African area could initially support the operations of only a limited number of aircraft and that no object would be served by piling in units impossible to employ by default of supplies or air-dromes. Therefore, Arnold contended, why not concentrate them in England, where facilities were comparatively abundant and whence pressure could be maintained on Germany and reinforcements could flow to Africa as needed? Perfectly consistent, Arnold on the same

grounds had opposed the diversion from USAMEAF of the 33d Fighter Group.<sup>111</sup>

Not long afterwards, Arnold departed on an inspection of the Pacific to see for himself whether facilities in that area were adequate to the number of planes the naval and local army commanders were demanding.<sup>112</sup> Before he left he held a conference with Maj. Gen. George E. Stratemeyer, chief of the Air Staff, which the latter duly reported to Spaatz on 17 September. Arnold suggested that Spaatz leave his bomber commander, Maj. Gen. Ira C. Eaker, in charge of the Eighth Air Force and accompany Eisenhower to Africa. "You really should be designated CG AAF in Europe," read Stratemeyer's letter.<sup>113</sup> This suggestion was the logical culmination of the AAF contention that Africa and England constituted a single air theater, and it represented the hope that the strategic bombing effort could be protected by securing for one of its outstanding exponents a command position at theater headquarters.

Spaatz' answer on the 25th,<sup>114</sup> cleared with Eisenhower, was cautious. He pointed out that as commanding general of the Eighth Air Force he already exercised control over the formation of the Twelfth and that after the Twelfth got to Africa it would need no strategic direction by an air officer; Eisenhower could direct it. Under the provisions of an order of 21 August, Spaatz was already the air officer of ETOUSA, with the function of advising the commander in chief.\* Therefore he could be ordered to Africa by Eisenhower if the situation warranted. For himself, he thought he would be more useful with an Eighth Air Force "increasing in size and importance."

If Eisenhower had been rather cool to the idea of an over-all air force, he nevertheless appreciated the usefulness of an over-all air theater wherein air units could be shifted as the situation demanded, and in communications with Marshall he spoke highly of current Eighth Air Force daylight operations, although he mentioned that they were extremely dependent on weather.<sup>115</sup> On 21 October,<sup>116</sup> as TORCH drew near, he told Spaatz that he did not wish the Eighth to be disturbed in its operations while he was out of England and that he would in all probability, after TORCH was complete, return for the ROUNDUP operation, to which prospect he looked forward with satisfaction.<sup>117</sup> Here the commander in chief was perhaps reflecting

\* See Vol. I, 591.

War Department hopes, for no Allied decision had charted any strategic course subsequent to TORCH.

On 29 October, Eisenhower proceeded to approve the theater air force project, about which by all outward signs he had previously entertained misgivings. Whether he did so in anticipation of a future ROUNDUP, or of future Mediterranean operations, is not apparent; he may have simply perceived that the theater air force, capitalizing on the mobility of air power, could be a most valuable aid in any situation brought on by or subsequent to TORCH. In some ways, it was a device ideally suited to the strategic fogs of late 1942, in which Eisenhower was feeling his way along without any directive as to post-TORCH operations.<sup>118</sup>

As outlined by Spaatz to his chief of staff immediately after his conversation with Eisenhower on the 29th, the gist of the plan was as follows: assuming the possession of the North African littoral, Eisenhower hoped to place a single command over all U.S. air units operating against the European Axis and promised to advocate the inclusion thereunder of Brereton's units, as well as the Eighth and Twelfth. This force, making use of bases "from Iceland to Iraq,"<sup>119</sup> could exploit the strategic mobility of the flight echelons of the air force. Spaatz mentioned that such a unified command could expect to be more favored by the CCS than two or three separate commands competing for resources to destroy Germany—in this way more effective arguments could be brought against diversions to the Pacific. Eisenhower had been explicit in his instructions. He informed Spaatz that he intended to name him to the over-all command, and anticipating that the success of TORCH might permit the matter to be put forward in a month's time, he specified that Spaatz be prepared to bring to him in thirty days, wherever he might be, a plan in the form of a cablegram to the CCS.

Spaatz accordingly made his arrangements. He counted on moving Eaker up from the command of VIII Bomber Command to that of the Eighth Air Force and on utilizing the Eighth Air Force staff as the nucleus of the theater air force staff; he directed that plans to achieve the required mobility be immediately undertaken, and to Brig. Gen. Haywood S. Hansell, Jr., he gave the responsibility of preparing the cablegram called for by Eisenhower. On 30 October he conferred with Doolittle and briefed him on the prospect,<sup>120</sup> emphasizing the importance of getting the African airdromes equipped to service heavy



bombers moving in for short periods and reminding him that, if either Sardinia or Italy were taken, shuttle bombing between these points and the United Kingdom would be possible, which would put operational planning on the basis of bomber range rather than tactical radius. On 31 October he reported the development to Arnold,<sup>121</sup> pointing out that it was quite possible that Eighth Air Force heavies could be better operated from Africa during the winter—October had brought miserable weather in England—and that the setup operated both ways: bombers could be shifted back into England for the main effort.

On 2 November, not long before he left for Gibraltar, Eisenhower reiterated his support of the plan,<sup>122</sup> asking that the theater air force be stressed in Spaatz' communications with Arnold and informing the Eighth Air Force commander that as soon as he had established what could be accomplished from the various air base areas in England and Africa he should proceed to AFHQ. Studies of the capabilities of air power in the Mediterranean were undertaken<sup>123</sup> and the organizational implications of a theater air force put under scrutiny, a hitch developing in this latter regard on 12 November when Bedell Smith, Eisenhower's chief of staff, chose to regard the theater air commander as merely chief of the air section of the general staff. However, this matter was left for later determination, and on the same day Spaatz' staff drew up a draft memo on a subject very dear to his heart: the reassignment of the Twelfth's two B-17 groups to the Eighth Air Force.<sup>124</sup>

Since August the Eighth had contributed much to the forwarding of TORCH, and at considerable cost to itself. That it would continue to be levied upon long after 8 November had been made abundantly clear. To mention two factors, the assembly and modification of the Twelfth's aircraft, with which the Eighth was charged, lagged behind schedule, and secondly, Eisenhower required that Eighth Air Force units be prepared for operations in Africa. A further subordination of the Eighth to the Twelfth's needs came with supply arrangements reached on 31 October, whereby it was provided that if the Twelfth in Africa did not get its supplies satisfactorily from the United States on an "automatic" basis, VIII Air Force Service Command would stand ready to make up the deficiency. This later resulted in a tremendous depletion of the Eighth's stocks, an officer of VIII AFSC estimating that "75 per cent at least" of its supplies went to Africa when the Twelfth moved down.<sup>125</sup> Lower-echelon personnel of the Eighth, not unnaturally, tended to resent the progressive loss of their weapons and equipment



to an upstart organization of whose mission they were entirely ignorant. But even such men as Spaatz, Eaker, and Sir Charles Portal, who knew what was afoot with the Twelfth, had been dismayed by the diversion of the 97th and 301st, the most practiced and until October (with the exception of the 92d) the only heavy groups operational in the whole Eighth Air Force.<sup>126</sup>

The memo for Eisenhower, drafted on 12 November,<sup>127</sup> was intended to be worked up for use within a week or two. It assumed that Rommel had been smashed and that his line of communications and rear were no longer targets. Therefore, the 97th and 301st should be reassigned to the Eighth to bolster its small bomber force's efforts against Germany. The memo did admit that perhaps all the heavies might be brought to Africa if the weather over northwestern Europe did not improve, but the units would go as Eighth Air Force units, the Ninth and the Twelfth to furnish the base facilities.

While Spaatz had been busying himself with the theater air force, TORCH, whose engrossing of the North African coast would give the plan reality, had swung into action. Eisenhower and his staff flew down to Gibraltar on 5 November, his B-17 being forced to circle the Rock for an hour because of the congestion on the runway. Doolittle, whose B-17 had been delayed in getting off from Hurn, came in the next day only after a brush with four Ju-88's off Cape Finisterre.<sup>128</sup> By then the assault convoys from England and the United States had been under way for over a week. There would soon be an answer to the questions that had agonized the TORCH planners: Would the French resist and how seriously? Had the secret been kept? Would the Spaniards join in? Would the weathermen's predictions get the Western Task Force ashore?

## CHAPTER 3

\* \* \* \* \*

### *THE LANDINGS AND THE RACE FOR TUNIS*

THE Twelfth Air Force's role in the assault phase of the TORCH operation was, in the aggregate, a minor one. At Algiers, the RAF, which had Spitfires and Hurricanes from Gibraltar operating out of Maison Blanche by noon of D-day, shared with the Royal Navy's Fleet Air Arm the responsibility of cooperating with Maj. Gen. Charles W. Ryder's Eastern Assault Force, to which the city was surrendered by nightfall.<sup>1</sup> In the more stiffly contested actions at Oran and Casablanca, carrierborne aviation furnished a major part of the air offensive. The Twelfth did, however, contribute substantially to the discomfiture of the defenders of Oran.

Oran lies about 230 miles east of Gibraltar, where the Mediterranean is still narrow. The town enjoys considerable natural protection in the steepness of the adjacent coast and in the chain of salt marshes in its hinterland. Allied estimates put the potential daily intake of its port at upwards of 4,000 tons, not counting the naval base at Mers-el-Kébir, three miles to the westward across Oran bay. Besides Tafaraoui and La Senia, there were several landing grounds in the area which figured in Twelfth Air Force plans: Oggaz, Fleurus, Saint-Denis-du-Sig, and Lourmel.

Because of the state of its arms and morale, the French army in the Oran area was not expected to put up a prolonged resistance, although it could bring about 21,000 troops to bear by D plus 2. On the other hand, the coastal batteries, manned by naval personnel nursing distaste for the British, were likely to resist in determined fashion.<sup>2</sup> The local air force, supposed to cherish substantial pro-Allied sentiments, mustered about fifty-five fighters (Dewoitine 520's) and about forty obso-

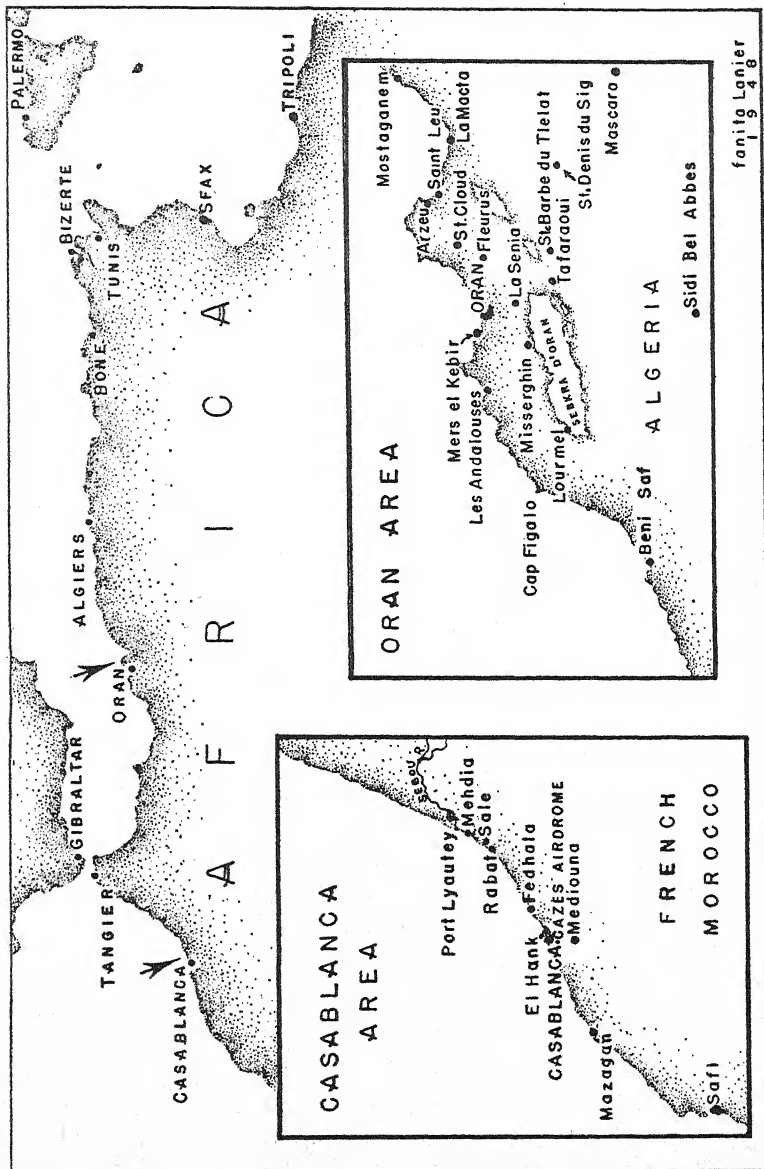
lescent bombers, the majority of the force being based at La Senia.<sup>3</sup> The Allies did not know prior to D-day what naval units would be in port; as it turned out, there were an escort vessel, four destroyers, and a number of submarines.<sup>4</sup>

Against the French establishment at Oran was pitted the Center Task Force, which included British naval elements under Cdre. Thomas Troubridge and American ground and air force troops under General Fredendall, once the old GYMNAST commander. Troubridge's fleet comprised the headquarters ship *Largs*, the battleship *Rodney*, the carrier *Furious*, the auxiliary carriers *Biter* and *Dasher*, the AA ships *Delhi* and *Alynbank*, the light cruisers *Aurora* and *Jamaica*, besides various destroyers, corvettes, mine sweepers, trawlers, and other craft. The *Furious* carried twenty-four Seafires and nine Albacores; the *Biter*, fifteen Hurricanes; the *Dasher*, nine Hurricanes. Fredendall commanded II Corps troops: 1st Infantry Division, 1st Ranger Battalion, and Combat Command B of the 1st Armored Division.<sup>5</sup>

The Center Task Force's directive specified that it was to assault and capture Oran and its airdromes and prepare, in conjunction with the Western Task Force, land and air striking forces to secure Spanish Morocco, if this proved necessary. It was responsible for the establishment and maintenance of communications with the Western and Eastern task forces. Once command had passed from Troubridge, Fredendall had control of all ground, air, and service units of the task force; the command channel would then be from CTF to 1st Infantry Division, to Combat Command B of 1st Armored Division, to Oran air force under Col. Lauris Norstad, Doolittle's A-3.<sup>6</sup>

The tactical plan envisioned the investment of Oran by a double envelopment from beaches east and west of the city, the advance from the beachheads to be supported by the guns of the British fleet. Two regimental combat teams of the 1st Infantry Division were to land at Z beach, the little town of Arzeu east of Oran; a third RCT at Y beach (Les Andalouses) west of the city. One column of Combat Command B's tanks would come in through the Arzeu beachhead; another detachment was to land at X beach, the cove of Mersat bou Zedjar, to the west of Les Andalouses. Tafaraoui and La Senia constituted the first objectives of the armor; upon their capture Combat Command B would attack Oran from the south.<sup>7</sup>

The Fleet Air Arm, responsible for the protection of the convoys and the landings and for cooperation with the ground forces until such



time as the Twelfth put in an appearance, planned strikes at first light on D-day against La Senia, hoping to break the back of the French air force if it did not turn out friendly to the Allies.<sup>8</sup> A feature of the Oran attack added early in October was a commando-type raid on the harbor. HMS *Walney* and *Hartland*, former U.S. Coast Guard cutters, flying the American flag above the Union Jack, were to land personnel to overcome the harbor forts and batteries and prevent sabotage of the wharves and shipping.<sup>9</sup>

### *Oran*

The Oran convoy passed through the Gibraltar Strait at 1700 hours, 6 November, after an uneventful passage from the United Kingdom—the Atlantic U-boat pack had taken off after a small England-bound convoy out of Sierra Leone and left clear the sea paths to Gibraltar and Morocco. TORCH was beginning to enjoy more good fortune than the ordinary military operation had any right to expect. Despite the fact that Vichy and Berlin had been anticipating an Allied stroke against French North or West Africa for months, the Germans, getting their first inkling that something was afoot when the convoys were reported at Gibraltar, mistook the movement for another attempt to provision Malta or a landing somewhere in the eastern Mediterranean to hem in the late invaders of Egypt. The Italians, on the other hand, perhaps because of their natural nervousness at the possibility of such a development, correctly interpreted the Allied strategy. As the Algiers and Oran convoys, in that order, came on through the narrow sea on the Malta course, dive-bomber and fighter squadrons began gathering in Sicily and Sardinia. The convoys did not alter course until dusk fell on 7 November. At Oran, the military establishment had been alerted on the morning of the 7th by aerial reconnaissance, but the alert was abandoned as the convoys passed eastward. Troubridge slipped back through the moonless night to take position. H-hour at Oran and Algiers was 0100.<sup>10</sup>

At five minutes before H-hour, two companies of Rangers were put into Arzeu. They diminished resistance sufficiently so that the 1st Infantry Division occupied the town in force by 0745. The French, however, blocked further progress on the road to Oran at the village of Saint-Cloud. The western arms of the envelopment had meanwhile got ashore. The 26th RCT came in unopposed at Les Andalouses, but French artillery denied it the height of Djebel Mourdjadjo, command-

ing Mers-el-Kébir and Oran. The western column of Combat Command B, after considerable difficulty in finding X beach, carried out a rapid advance which took Lourmel and had rolled on to the vicinity of Misserghin by the afternoon. Already the gallant *Walney* and *Hartland*, victims of the expectation that the French might offer only token resistance, had met disaster in Oran harbor. During the day Vichy destroyers issued in hopeless sorties against Troubridge's fleet. Stubborn coastal batteries engaged the *Rodney* in frequent duels.<sup>11</sup>

On the afternoon of D minus 1, 7 November, Eisenhower had sent off his ADVANCE NAPOLEON, the code message which meant that Bentley's C-47's would take off for Oran around 2200 hours with a peaceful daylight landing at La Senia in prospect. During the next two days he worried intermittently over the fate of the paratroop force, which he intended, once it had landed at La Senia, to send on to Maison Blanche, Bône, and possibly to Tunis itself, as part of a series of rapid advances to forestall the Germans and Italians. As it turned out, it took several days for the Paratroop Task Force to collect itself after its initial experiences in TORCH.<sup>12</sup>

The C-47's took off on schedule from Predannack and St. Eval, while RAF Spitfires and Beaufighters patrolled overhead, and assembled over Portreath, the flights intermingling to some extent before course for the first leg was set for the Scilly Islands. On the way south, because of the burning out of formation lights and because of the inability of the aircraft to home on squadron commanders, the formations disintegrated amid increasingly bad weather, many aircraft proceeding individually across Spain and over the Mediterranean. Nor could the secret radio or the fleet off Oran reassemble the C-47's: the operator of the former had destroyed his radio when no aircraft were in evidence at the earlier time of arrival specified by "war plan"—he had not been informed that "peace plan" was on; the homing ship transmitted on 460 kilocycles instead of the planned 440.

Some of the unarmed troop carriers reached the vicinity of Oran shortly after daylight and found the French at La Senia and their Dewoitines not as friendly as forecast. Bentley, accompanied by a group of his transports, discovered to his disgust that he had been homing on a lighthouse near Melilla in Spanish Morocco; he finally got to Oran to find a dozen C-47's down on a dry part of the bed of the Sebokra d'Oran, the largest of the salt lakes ringing the port. While reconnoitering La Senia, he himself was forced down by motor trouble

and taken prisoner. Not without further mishap, Colonel Raff finally brought the bulk of his paratroops into Tafaraoui late in the afternoon, where American armor was enjoying what seemed to be a very uncertain tenure. The paratroop force had suffered some casualties from the Dewoitines, however, and C-47's were scattered from Gibraltar all through the northwestern shoulder of Africa, with three interned in Spanish Morocco.<sup>13</sup>

Tafaraoui had been captured by the eastern column of Combat Command B which had passed, as planned, through the 1st Division beachhead at Arzeu, turned south, and dashed through Sainte-Barbe-du-Tlélat. It took Tafaraoui towards noon, after a short, sharp fight. The way was now open for land-based aerial reinforcements for the Center Task Force, heretofore relying on the Fleet Air Arm. The *Largs* notified Gibraltar.<sup>14</sup>

At about 1520 hours Doolittle arrived on the Gibraltar airdrome from the command post and ordered Col. John R. Hawkins to take his 31st Group fighters into Tafaraoui. The 31st had been scheduled for the Casablanca area, where the more strenuous resistance was anticipated, and was parked on the crowded airstrip in front of Col. Dixon M. Allison's 52d Group, which was to go into Oran. As any other arrangement meant delay, Doolittle ordered Hawkins' pilots to take off, which they did inside of twenty minutes—two squadrons of Spitfires—flying around thundershowers on the way to Oran and trying vainly to contact the fighter control which according to their briefing would have been set up at Tafaraoui. They arrived at 1700 hours. Hawkins found a section of the runway without holes and led his pilots in for a landing. French artillery was registering on the airdrome and some of the Spits still airborne temporarily silenced it by a strafing attack. Four Dewoitines, mistaken for Hurricanes, had been doing lazy eights over the field as the squadrons arrived; when the last four Spits were in a landing circle with wheels down the Dewoitines came in for an attack and shot down and killed one pilot, only to lose three of their number.<sup>15</sup> The ubiquitous Dewoitines to the contrary, the French air strength had already been largely crippled by the Fleet Air Arm's strikes at the La Senia hangars.<sup>16</sup>

On the morning of 9 November, after the African night had echoed to sniper fire and rung to the ingenious American challenge "Heigh-ho Silver"—reply, "Awa-a-y"—the French air force made a farewell gesture when a single bomber dropped a lone bomb on Tafaraoui, damag-



ing one of the C-47's which had flown in from the Sebkra the previous day. The 31st had a patrol up, but darkness and lack of radio equipment permitted the bomber's escape. Before noon the remainder of the French aircraft at La Senia left for the comparative safety of Morocco. Shortly after daylight, as the field was being shelled by the everlasting 75's, a motor convoy containing ground personnel of the 31st rolled into Tafaraoui from Arzeu. By dint of improvisation and use of French ammunition and gas, they kept the Spitfires in the air thereafter.<sup>17</sup>

The 31st rendered important aid in the stubborn battle for Oran. Shortly after dawn on the 9th, three of its Spits on reconnaissance southward discovered a large hostile force moving up from Sidi-bel-Abbés. Continuing attacks, enduring four to five hours, were maintained against the column, which turned out to be the famous Foreign Legion. The light French tanks offered pitiful opposition to the Spits' 20-mm. guns, and the discouraged Legion eventually turned back, after which it was not further molested. Hawkins, using the radio in the armored force's command tank and later those in the Spits, had established communications with the *Largs*. The command ship assigned several missions: one against coastal guns too heavily protected for effective strafing, another against what proved to be an American unit, which promptly shot down two of the offending Spits—the command ship had identified the target as west of La Macta when it had meant to say east. Flights of the 31st, however, were able to silence the troublesome 75's which had intermittently shelled Tafaraoui. During the afternoon Doolittle arrived in a B-17 with Spitfire escort from the 52d Group. Altogether, seventeen missions, totaling forty-five sorties, were flown during the day.<sup>18</sup>

Meanwhile, the ground forces had been making progress. The 1st Division began to bypass the French hedgehog at Saint-Cloud, but its 18th RCT was still pinned against the mountains west of Mers-el-Kébir. The western armored column bypassed Misserghin by routing its armor through the soft ground at the edge of the Sebkra, and the defenses of La Senia were finally cracked with the aid of strafing Spitfires. Once junction had been made between the armored wings, the fall of Oran was a foregone conclusion, failing a resort to the barricades in the city itself. The French perceived this towards noon of the next day and got armistice negotiations under way.<sup>19</sup>

While the fighting lasted on the 10th, the Tafaraoui Spitfires continued to exert themselves in various roles, but the French were paying

more attention to dispersal and concealment and few profitable targets were to be found. The general performance of the airmen earned the adjective "splendid" from Doolittle and a letter of commendation from Maj. Gen. Terry Allen, commanding the 1st Infantry Division. Losses since 8 November included one in combat, four from ground fire, and two in taxiing. Six of the 52d's aircraft had run out of gas on the way in from Gibraltar and came down in various places; only twenty of the 60th Group's C-47's were operational on the 10th.<sup>20</sup> But Algeria was now secure—the door open for aerial reinforcement for the campaign developing in the east. On the 11th and 12th the 31st put reconnaissance flights over Spanish Morocco, but despite rumors to the contrary, there was nothing tangible to indicate that the Spaniards there intended any hostile move.<sup>21</sup>

### *Casablanca*

Patton's Western Task Force succeeded in effecting a landing on a coast where a respectable body of military opinion held a successful landing highly improbable. The Moroccan rivers are shallow; the Moroccan beaches long and shelving; there is an abundance of rocky outcrops. High surf and swell are common even in good weather, and good weather is generally rare in the autumn. Yet Patton's men reached the beaches over what was reportedly the calmest sea in sixty-eight years.<sup>22</sup> Once ashore, on the other hand, their operations were more protracted than had been expected; the fierce resistance put up at Mehdia and the approaches to the Port Lyautey airdrome did not allow XII Air Support Command's aircraft to fly in in time to join the action against the French.

Algiers capitulated on D-day itself; Oran gave in on D plus 2. On the west coast where the resident-general, Auguste Nogues, was forewarned by American sympathizers who attempted to convince him that resistance was futile, Casablanca held out until D plus 3. Because of an almost complete failure of communications, the anxious Eisenhower at Gibraltar heard very little from Patton during the early stages of his landing, and as late as 10 November many of Patton's own officers were reported pessimistic as to the prospects. But the operation, like the singed cat, was better than it looked. The fall of Oran really sealed Casablanca's fate, as the French could not have withstood an additional attack coming overland from Algeria. There was ample scope for guerrilla resistance in Morocco, however, as there was any-

where in North Africa. Fortunately, Darlan persuaded Nogues to give up early on the morning of 11 November.<sup>23</sup>

The defenses of Morocco were formidable enough. The French had added numerous batteries to the inhospitable coast, and moored in Casablanca harbor was the unfinished battleship *Jean Bart* whose four 15-inchers had to be reckoned with. The 55,000 troops allowed Morocco by the 1940 armistice were supposed to be better equipped than their colleagues in Algeria and Tunisia, as Nogues had found ways and means of circumventing the armistice commission. The French air force in the area, however, possessed only about 130 combat aircraft—Curtiss and Dewoitine fighters and an assortment of middle-aged bombers—whose rate of employment, as at Oran, was certain to diminish because of lack of gasoline and service facilities. Again, no friendly reception was to be expected from the embittered French navy. Whatever forces Vice Adm. Frix Michelier could bring to bear would probably fight with intelligence and determination. In the event, these included the light cruiser *Primauguet*, the flotilla leaders *Milan*, *Albatros*, *Le Malin*, seven destroyers, eleven submarines, and three sloops.<sup>24</sup>

The U.S. Navy, which was responsible for air as well as naval cooperation until XII Air Support Command could relieve it, brought over an armada huge by 1942 standards, partly in the expectation of a sally by the heavily armed *Richelieu*, reported at Dakar. The battleships *Massachusetts*, *New York*, and *Texas* and the cruisers *Augusta* (flagship), *Wichita*, *Tuscaloosa*, *Cleveland*, *Philadelphia*, *Brooklyn*, and *Savannah*, with attendant destroyers, oilers, and minelayers, sailed in Task Force 34, under Rear Adm. Henry K. Hewitt. Task Force 34's air group was commanded by Rear Adm. Ernest D. McWhorter. It included the *Ranger*, carrying fifty-four F4F-4's and eighteen SBD's; the *Sangamon*, carrying nine TBF's, nine SBD's, and twelve F4F-4's; the *Santee*, carrying an equivalent complement; and the *Swannee*, with nine TBF's and thirty F4F-4's. In the convoy sailed the *Chenango* with the P-40's of the 33d Fighter Group. The *Contessa*, with its cargo of gas and munitions and a crew derived partly from a Norfolk naval prison, sailed independently from Hampton Roads on 26 October.<sup>25</sup>

Patton commanded 37,000 ground and air force troops—the 3d Infantry Division and the 2d Armored Division fresh from landing practice at Solomons Island in Chesapeake Bay to bear the brunt of the attack. His mission was the occupation of the ports and airdromes in the Casablanca region, the establishment and maintenance of communica-

tions with Oran, and the build-up of air and land striking forces for possible use against Spanish Morocco. The scheme of maneuver was as follows: three surprise landings—supported after daylight by naval gunfire; elimination of the enemy air force by surprise dawn attacks; and the securing by the end of D-day of at least one airdrome for land-based planes. The main assault would strike at Fedhala, a pleasure resort thirteen miles north of Casablanca; it was to be coordinated with a landing at Safi 130 miles to the south. The most northerly attack, at Mehdia, eighty miles up the coast, had as its chief objective the Port Lyautey airdrome, to be captured it was hoped by the end of D-day.<sup>26</sup>

On 23 October, Task Force 34 began to put to sea out of Hampton Roads. The covering group, intended to contain the French naval forces at Casablanca and the *Richelieu* at Dakar, joined in mid-Atlantic from Casco Bay. The carriers joined on 28 October from Bermuda. The armada zigzagged across the Atlantic, feinting at Dakar and avoiding sea searches from the Canaries and the Azores. After 6 November, the weather began to clear and the task force prepared for battle. H-hour was 0400, three hours later than at Oran and Algiers.<sup>27</sup>

The main assault at Fedhala occasioned considerable confusion: many units landed at the wrong beaches; two boats strayed into Casablanca harbor, where they were unluckily discovered by a French patrol vessel. Ashore, however, the French mainly fought a delaying action, while they fortified the nearer approaches to Casablanca. At Safi, the landing, aided by some superior fleet gunnery, went fairly smoothly. By 1500 hours the sea train *Lakehurst* was unloading Shermans in the harbor. The *Santee*'s aircraft helping disperse French reinforcements coming from Marrakech, by 11 November the Safi force had reached Mazagan and was poised for a coordinated attack barely forestalled by Nogues' surrender.<sup>28</sup> True to form, the French fleet units spent themselves in desperate sorties against Hewitt's warships. The *Jean Bart* and the coastal batteries, however, were harder nuts to crack and the former, despite naval gunfire and bombing, was still able to fire at the time of the armistice. On 10 November the *Augusta* narrowly escaped hits from her 15-inch shells. On the nights of 11/12 and 12/13 November, four transports were torpedoed and sunk off Fedhala, whether by U-boats or French submarines out of Casablanca was unknown.<sup>29</sup>

Mehdia brought the most severe fighting of the entire operation. There, landings had been planned on both sides of the mouth of the

Sebou, while the destroyer *Dallas*, guided by a pro-Allied Frenchman, formerly a pilot on the river, was to proceed upstream to Port Lyautey. The main landing, immediately south of the estuary, encountered stiff resistance, French batteries driving the transports out of range and hostile fighters strafing the beaches, which necessitated calls to the carriers. The *Dallas* could not run the Sebou in the face of the fire from the walled Kasba at Mehdia, where Foreign Legion elements not only maintained themselves but on the morning of the 10th counterattacked and captured an American detachment which had penetrated their positions.

On the 10th, however, both Port Lyautey and Mehdia were finally cleared. After a Navy crew in a small boat had cut the net across the Sebou the night before, the *Dallas* scraped her way up the shallow, winding river and by 0800 landed a Ranger detachment at the airfield, which the French were contesting with a company of American infantry. Later the Army took the Kasba in an action reminiscent of *Beau Geste*.<sup>30</sup>

Headquarters of XII Air Support Command was first established on the beach and subsequently at the Miramar Hotel at Fedhala. When it was learned that the Port Lyautey field had been finally secured, Lt. Col. William W. Momyer's P-40's were ordered in from the *Chenango*. Despite misgivings of the Navy, the catapulting itself was fairly successful, planes eventually being launched at as little as two- or three-minute intervals. However, Navy shells and dive bombers had badly damaged the main runway at Port Lyautey and the rest of the field was soft. The catapulting, begun on 10 November, had to be discontinued and was not completed until two days later, some of the P-40's evidently going into Cazes airdrome at Casablanca. Of the seventy-seven P-40's launched from the *Chenango*, one crashed into the sea, one flew off into the fog and was never heard from, and seventeen were damaged in landing. None, apparently, got into action. Not long afterward, thirty-five more P-40's, the "advance attrition" of the 33d Group, arrived off Morocco on the British carrier *Archer* in the D plus 5 convoy. These planes were also catapulted and came down at Port Lyautey, four cracking up on landing primarily because of pilot inexperience.<sup>31</sup>

Thus the U.S. Navy's carrier aircraft had assumed the whole burden of air cooperation with the Western Task Force. They performed creditably by all accounts, ranging as far afield as Marrakech and

Rabat-Salé to attack the French air force, quickly responding to calls from the ground forces, and making effective attacks against the lighter French naval units sortieing out of Casablanca. During the hostilities, although it did not furnish air support against the French, XII ASC had taken on a variety of tasks. Its air support parties performed effectively; many of its units participated as assault infantry, a rare employment for Air Corps troops. Its service command personnel were running a gas-laden truck convoy into Cazes airdrome almost before the last shots in defense of the field had died away.<sup>32</sup>

### *Prelude to Tunisia*

Speed was the essence of the plan to seize Tunisia, for a bare hundred miles from the big prizes of Bizerte and Tunis lay the great Axis base of Sicily. And from Sicily, on 9 November, the morrow of the Allies' D-day, the Germans made their own invasion of French Africa—to get a rather better reception. They came in their three-motored Ju-52 transports, landed at El Aouina, Tunis' municipal airdrome, and were welcomed at the orders of Adm. Jean-Pierre Esteva, resident-general of Tunisia.<sup>33</sup>

Another factor, besides the proximity and energy of the Axis forces, made a quick eastward thrust imperative. Northern Tunisia, characterized by mountains and narrow valleys, is an area of considerable rainfall. The heaviest incidence of this rainfall is in the months from December through February when the lowlands experience a "particularly glutinous" mud. The Allies had therefore only about a month of good weather in which to contact and smash the Axis build-up.

On 9 November, the same day as the reception at El Aouina, Lt. Gen. K. A. N. Anderson arrived in Algiers to take charge of the eastward push, his principal instruments being the British First Army and the RAF's Eastern Air Command. While fighting still raged at Oran and Casablanca, Anderson began preparations against an objective 400 miles away over a country broken by mountains and deficient in highways and railroads. In such circumstances, an orthodox land advance was out of the question. The First Army, which, including American elements, never mustered more than the equivalent strength of one division and a single tank regiment during the critical phase of the first battle for Tunis, was to be rushed forward by landing craft, motor transport, and troop carrier aircraft to seize successive ports and the coastal airdromes to cover them.<sup>34</sup>



At the outset, a spell of rough sea cost the Allies two precious days. At dawn on 11 November the British 36 Brigade Group went ashore unopposed at the port of Bougie, 100 miles east of Algiers, but an attempted landing at Djidjelli, about 30 miles farther along the coast, was frustrated by a heavy swell. Before the airdrome at Djidjelli could be secured, enemy aircraft sank two British transports off Bougie and damaged the British carrier *Argus*, whose fighters, abetted by RAF fighters operating at extreme range from Maison Blanche at Algiers, were covering the operation. Next Allied objectives were Philippeville and Bône.<sup>35</sup>

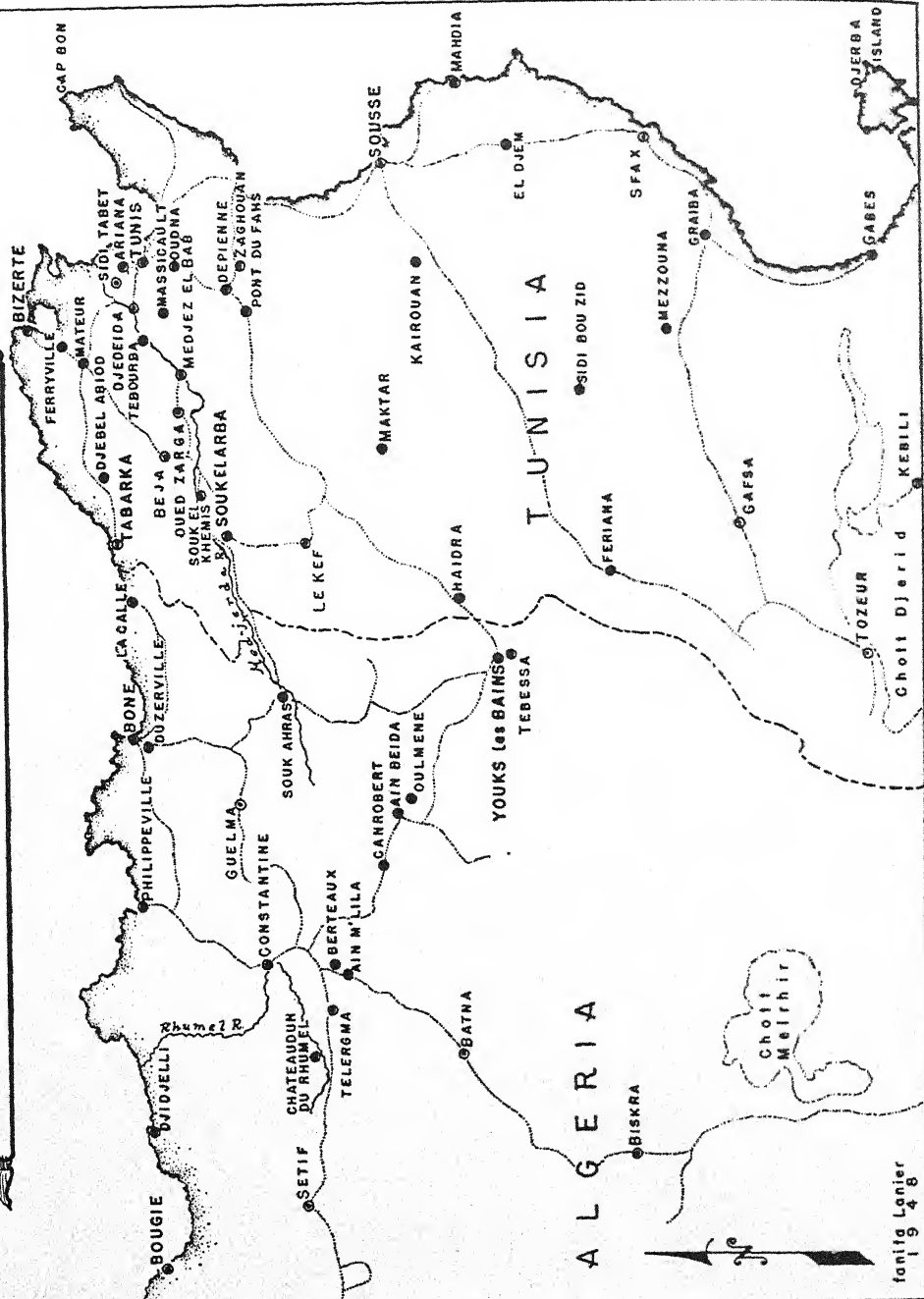
The intended use of the Paratroop Task Force at Bône had been frustrated by the force's dispersal during its D-day mission at Oran. On the afternoon of 8 November, therefore, the command post at Gibraltar ordered a second paratroop force into Africa. The next day, thirty-nine C-47's of the U.S. 64th Group, carrying two company groups of the British 3 Paratroop Battalion, left St. Eval for Gibraltar. Thirty-four of them made Algiers early on the morning of the 11th to be greeted by Allied anti-aircraft fire which wounded two men. Next morning, twenty-six of the troop carriers took off from Maison Blanche, and with fighter escort flew along the coast to the Duzerville airdrome, six miles southeast of Bône, where 312 paratroops were successfully dropped. At the port itself, British commandos had landed unopposed at dawn, but when night came the GAF bombed the Bône airfield so heavily as to threaten to make it untenable. This situation was somewhat relieved when the 64th's C-47's returned to Bône the next day, with P-38 escort, ferrying in gasoline and anti-aircraft guns.<sup>36</sup>

Meanwhile, the Allied commanders were laboring to bring over the hesitant French army forces in Tunisia, hoping to undo, at least partially, the effects of the initial admission of the Germans. Admiral Darlan and Gen. Henri Giraud issued orders for resistance to the Axis, and Giraud, accompanied by Lt. Gen. Alphonse Juin, prepared to make a personal reconnaissance of the Tunisian border. On 13 November, the Allies brought a convoy into Bône and disembarked BLADE Force, a British armored unit which immediately began operations to the east. By the 15th, elements of the 36 Brigade Group had occupied Tabarka, on the coast only sixty miles from Tunis, and American paratroops were jumping far inland.<sup>37</sup>

By 12 November the Paratroop Task Force (60th Troop Carrier Group and 2d Battalion, 503d U.S. Parachute Infantry) had assembled



# EASTERN ALGERIA AND TUNISIA



at Algiers and passed to the operational control of the First Army. Two days later Colonel Raff and Maj. Martin E. Wanamaker, commanding the transports, were called to headquarters and assigned a mission against Youks-les-Bains airfield, out near the Tunisian border. Intelligence about the area was meager, the reaction of the local French problematical, and enemy patrols might even be in possession of the field. Nevertheless, on the morning of the 15th, twenty C-47's left Maison Blanche, flew with Spitfire escort along the coast to Djidjelli, thence with Hurricane escort south; the formation was at one point forced onto instruments but, at 0945, 350 paratroops were successfully dropped.<sup>38</sup> Next day the 64th carried out a similar mission against the Souk-el-Arba airfield, ninety miles up the Medjerda valley from Tunis, dropping 384 British paratroops. This operation had been attempted on the 15th but was frustrated by weather. None of these paratroop landings was opposed, nor were any of the transports lost to enemy action, although on the way to Souk-el-Arba the 64th had watched enemy planes bombing and strafing the Bône airfield.<sup>39</sup>

The Axis was making a determined effort to establish a bridgehead in Tunisia, pouring men and weapons in from Sicily. By 17 November the hostile establishment at Bizerte, where the Ju-52's were averaging fifty landings a day, was estimated at 4,000 men, with an additional 1,000 in Tunis itself. This force mustered some medium tanks and the German and Italian infantry was strong in antiaircraft and antitank guns. The enemy had put about 150 fighters and dive bombers into the Tunis and Bizerte airdromes, and with long-range bombers from Sicily and Sardinia he was operating with some effect against the exposed communications of the First Army.

After prolonged indecision, the bulk of the French forces in Tunisia came over to the Allies. Gen. Louis Jacques Barré, commanding the French army in the protectorate, had been negotiating with the German commander, Gen. Walter von Nehring, ever since the Germans set foot in the country. He now broke off. The French began to harass the Axis advance, fighting patrol actions at Oued Zarga and Mateur on the 16th. By the 17th the British had made contact with German elements at Djebel Abiod on the coast road. In the south Raff's paratroopers had secured the cooperation of the French garrison at Tebessa and began to clash with Italian patrols moving inland from Sfax and Gabès.

Barré had agreed that he would cover the British 78 Division's con-

centration in the forward area and its right flank during the subsequent advance on Tunis. In the interim, Eisenhower hoped to use the weak French units in a kind of psychological warfare against the Germans. He urged that they make a great show of activity, spread rumors of formidable American and British columns in their immediate rear, and generally induce the enemy to tie himself down to local defense of Tunis and Bizerte. The Germans, however, after two ultimatums, Nehring to Barré, drove the ill-equipped French out of Medjez-el-Bab on the 19th, inflicting heavy losses on them with dive bombers and tanks. The 78 Division delayed its advance until it could build up forces and supplies and deploy the French to the south.<sup>40</sup>

On 19 November, while the French were being driven from Medjez-el-Bab and the British First Army was girding for an advance, Doolittle, whose air force had not yet been heavily committed to the Tunisian operation, was writing a long letter to Arnold reporting on early developments in Africa.<sup>41</sup> The Twelfth had been chiefly occupied in setting up housekeeping and building strength in western Algeria and Morocco, the areas assigned it by the TORCH planners. However, six of its B-17's had already inaugurated USAAF bombing of the Axis forces in Tunisia, the 340th Squadron of the 97th Group having dumped British bombs on Sidi Ahmed airdrome at Bizerte on 16 November. The 340th had left England on the 10th, come into Maison Blanche on the 13th after a two-day stopover at Gibraltar, and set about "promoting" transportation and pouring gasoline from five-gallon flimsies in preparation for its first raid. Over Bizerte, its B-17's reportedly knocked down one of the Me-109's which rose to intercept.<sup>42</sup>

In Algeria, the Twelfth's build-up had been rapid: the area had even received by 19 November (D plus 11) the approximate number of aircraft which the plans specified for that date.<sup>43</sup> The two Spitfire groups (31st and 52d) had successfully cleared Gibraltar, much to Doolittle's relief, and other units had flown in from England with trifling losses, lending color to one facet of the AAF's contention that the two theaters were complementary so far as air operations were concerned. Altogether by D plus 11 there were in Algeria four fighter groups minus one squadron (1st, 14th, 31st, 52d), one light bomber squadron (15th), two troop carrier groups, and two B-17 squadrons of the 97th Group. A good many factors, however, limited the usefulness of this force. Its ground echelons were scattered; airdromes and all manner of sup-

plies were limited; besides, western Algeria, where most of the units were situated, was not an active theater of war. In Morocco, General Cannon's build-up was not so impressive, chiefly because the Twelfth's P-39's still languished in Eighth Air Force depots, but he had, besides the 33d, parts of the 62d (troop carrier) and 310th (B-25's); and so far, with the pacification of the French and the inactivity of the Spaniards, it did not appear likely that he would immediately need a great mass of air power.<sup>44</sup>

Supplies were being hauled from the docks to the airfields, a great part in rejuvenated French vehicles, for the Twelfth was beginning to suffer from the lack of motor transportation that would plague it well into the Tunisian campaign.<sup>45</sup> The French contributed in other ways, the USAAF making good use of their weather net<sup>46</sup> and of such aircraft repair and erection facilities as offered, particularly at the Cazes airdrome at Casablanca.<sup>47</sup> However, the French airfields had not been equipped for such a rush of visitors, and a really gorgeous congestion developed at Oran shortly after its conquest, Tafaraoui and La Senia, with accommodations for 300 officers and 3,000 men, playing host to Air Corps contingents about three times too large.<sup>48</sup> A more serious deficiency of the French airfields lay in their general lack of all-weather facilities—hardstands and hard-surfaced taxiways and runways. In the area from Casablanca to the Tunisian border, there were just four airdromes with hard-surfaced runways of any description: Port Lyautey, Tafaraoui, Maison Blanche, and Bône.<sup>49</sup> This factor was to assume controlling importance when the winter rains set in.

Despite the fact that the Eastern Air Command was, on paper, mainly responsible for air cooperation with the First Army, it was a foregone conclusion that the Twelfth would be ordered into the Tunisian battle, especially since no threat had developed to the LOC through the Strait of Gibraltar. Such a movement would naturally have to be coordinated with Air Marshal Welsh's plans, since he had jurisdiction over the eastern area. On 19 November, Doolittle, whose units were soon to be released from the control of the task force commanders,<sup>50</sup> was in Algiers on that errand; he expected a conference with the air marshal before the day was out. Meanwhile, he had evolved his own ideas for the organization and employment of the Twelfth.<sup>51</sup>

Before the invasion, when the intention was to deploy the Twelfth mainly in the western area, it had been anticipated that air force headquarters, together with fighter and bomber command headquarters,

would be at Oran and that XII Air Support Command with observation, light bombardment, and troop carrier wings would be attached to the American Fifth Army.<sup>52</sup> By 19 November, Doolittle had made some radical departures from this idea.<sup>53</sup> He saw that he had two principal responsibilities: to get his striking force into eastern Algeria and Tunisia and to be prepared to combat hostile moves jeopardizing the safety of the LOC through Gibraltar. Therefore he planned to break up the vast African area into districts and install in each a composite command, capable of operating both fighters and bombers as strategic circumstances dictated. These flexible commands were to be under direct control of air force headquarters and their staffs were to be derived from existing air force organizations; XII Air Support Command was to be left temporarily at Casablanca; XII Fighter Command would function at Oran; XII Bomber Command was to be placed somewhere south of Bône. The Algiers area would be administered by Twelfth Air Force headquarters itself—the advance headquarters of the Twelfth was at Algiers by the 18th and the headquarters at Tafaraoui seems to have been closed by the 28th.<sup>54</sup>

Doolittle's hope that his bomber command might be assigned a sector farther east was gratified on the 20th when Forward AFHQ approved the use of Constantine as headquarters, indicating it to be the only available location with the communications to support such an echelon; Claude Duncan, the bomber commander, began making his preparations.<sup>55</sup> Moreover, Welsh decided to deploy Doolittle's P-38's (14th Group) and DB-7's (15th Bombardment Squadron), which were at Algiers ready for action, in the Tebessa—Youks-les-Bains area, from which Raff's paratroopers and their new-found French friends were operating.<sup>56</sup> Doolittle got his C-47's busy ferrying supplies into Youks.<sup>57</sup> The two U.S. Spitfire groups were left for the time being at Oran as a reserve for the Spits of the Eastern Air Command.<sup>58</sup> The early configuration of the Twelfth Air Force was taking shape.

On 21 November one squadron of the 14th Group moved down to Youks and immediately found itself engaged with an enemy force moving on Gafsa. Two strafing missions were flown against the column the first day, six P-38's being lost when they attempted to land at Youks after dark.<sup>59</sup> Soon afterwards, the 15th Squadron joined the P-38's, each DB-7 carrying two 500-pounders down from Maison Blanche with an eye to immediate operations, and passed under the control of the 14th's commander, Col. Thayer Olds, and XII Fighter Command.

For a long time the units at Youks were to be dependent on air transport.<sup>60</sup>

One of the first reverses sustained by the Twelfth occurred when the GAF and IAF drove its B-17's out of the Algiers region. On the 19th, before they left for Youks, the 14th Group's P-38's had escorted the 97th down to Tunis, where, according to Doolittle, the bombers destroyed eight aircraft on the El Aouina airdrome, neither B-17's nor escort suffering loss.<sup>61</sup> But the enemy was pounding Algiers nightly from Sardinia. On the night of the 20th he outdid himself at Maison Blanche. With a force estimated at upwards of thirty Ju-87's and 88's, he destroyed four Spits, three Beaufighters, two P-38's, a B-17, and an entire RAF photo reconnaissance unit. No interception could be made as no Allied fighters possessed aerial interception equipment. Eisenhower worried over these raids as Algiers abounded with targets, and he immediately appealed to the CCS and the Air Ministry for night fighter, radar, and balloon units.<sup>62</sup>

Spaatz, who was on a tour of the area, had inspected Maison Blanche on the 18th and concluded that it was too exposed for heavy bombers.<sup>63</sup> He conferred with Eisenhower at Gibraltar the next day, and a cable went forward from the command post suggesting to Clark and Welsh that the B-17's be moved to Tafaraoui, where maintenance would be easier. From Tafaraoui the B-17's could still reach Tunis, picking up escort at Maison Blanche or at a more advanced base. Not until still another night raid had claimed an additional B-17 were the heavies moved out, on 22 November. Thenceforth, until mid-December, they operated from Tafaraoui, where, as the famous rhyme had it, the mud was "deep and goeey."<sup>64</sup>

### *Repulse before Tunis*

Having straightened out a considerable mixture of French and British troops and arranged the French role in the forthcoming hostilities, Anderson launched his offensive on the 24th with the line of Tebourba-Mateur as the first objective—the ultimate plan being to drive a wedge between Tunis and Bizerte, capture the former, and hem in the Axis forces on the northernmost tip of Tunisia. Progress was at first steady. On the morning of the 26th the 78 Division flanked and captured Medjez-el-Bab, while BLADE Force advanced to a point midway between Mateur and Tebourba. On the night of the 26th Tebourba itself was taken, and counterattacks employing tanks and dive



bombers were beaten off. Djedeida, from which the ridge of the Kasba at Tunis could be seen, only sixteen miles away, was reached by the 28th.<sup>65</sup>

The Eastern Air Command was covering the advance primarily from Souk-el-Arba and had brought a squadron of Bisleys (Blenheim V's) into Canrobert for night bombing operations against the bridge-head. To bolster its air defense of much-bombed Bône, Doolittle lent the 2d Squadron of his 52d Group, which arrived at the airfield on 27 November. Until the 2d retired from Bône on 11 January 1943, it was at times altogether out of touch with the Twelfth Air Force, such a situation arising with many units during the hectic early days.<sup>66</sup> Although for one reason or another Operation BREASTPLATE, a coordinated landing at Sousse by part of the Malta garrison, had been abandoned, Malta was contributing substantially to Anderson's drive. Reinforced with Beaufighter and Wellington squadrons from the Middle East, its air establishment had passed to the offensive, striking at ports, airdromes, and airborne and seaborne reinforcements in the Sicily-Sardinia-Tunisia triangle.<sup>67</sup>

During the First Army's advance, the Allied bomber effort from Algeria, whether by Bisleys, B-17's, or DB-7's, was mostly directed—by Anderson—against the principal Tunisian airfields in the hope of crippling the enemy air strength. After their removal to Tafaraoui, however, the B-17's made one attempt to strike at Cagliari/Elmas airdrome in Sardinia, a base for the attacks on the Algerian littoral, only to be frustrated by weather. Next day, on the 24th, the heavies were turned back from Bizerte, again by clouds.<sup>68</sup> It was reported that the weathermen were having difficulty with their forecasts because of the mass of enemy territory to the north.<sup>69</sup> Soon P-38's began to be used on early-morning weather reconnaissance of the general target area. On the 28th, thirty-seven B-17's, including a contingent from the newly arrived 301st Group, bombed the Bizerte airdrome and the adjacent docks without escort, provoking an air battle with a mixture of Me-109's and FW-190's in which claims of ten enemy fighters destroyed were assessed as against two bombers shot down.<sup>70</sup> From Tafaraoui to Bizerte is almost 600 miles. The B-17's were operating at close to their maximum tactical radius. For any aircraft short of gas on the return leg, however, there were many friendly airdromes east of Oran, particularly Maison Blanche, where one squadron of P-38's of the 1st Fighter Group was being assembled for bomber escort. On 25



November, another of the 1st's squadrons, the 94th, had been sent down to reinforce the 14th Group at Youks-les-Bains.<sup>71</sup>

The remote units at Youks at first were fighting their own air war, ranging down to the Tunisian east coast where, on the 24th, the P-38's had a field day against German and Italian transport aircraft near Gabès. They protected the Allied force in central Tunisia, consisting of six French battalions and Raff's reinforced paratroop battalion, which in turn protected the extreme right of the First Army in the north. The American air units at Youks, however, soon found their principal targets in the area affected by the main push at Tunis and Bizerte, although at times conflicts developed between the requirements of the two sectors. On 27 November the Youks aircraft were made available to the British 78 Division operating forward of Medjezel-Bab.<sup>72</sup>

On 28 November the Anglo-American force pushing at Djedeida and Mateur seemed about to break through the crust of the skillful German defense, despite intensive bombing by Ju-87's and Ju-88's. The situation report for that date was particularly optimistic, describing heavy enemy tank losses, Djedeida being cleaned up, Pont-du-Fahs evacuated, enemy supplies abandoned and burning. At this point a paratroop attack was ordered for the 29th against the area immediately southwest of Tunis.<sup>73</sup> The principal objective was evidently Oudna airdrome, ten miles from the capital; Oudna captured and any stores and aircraft there destroyed, the paratroops were to infiltrate the southern approaches to Tunis; eventually they would link up with the advancing Allied army.<sup>74</sup>

Under the personal command of Col. P. L. Williams, the drop was made between 1330 and 1400 hours at Depienne, ten miles northeast of Pont-du-Fahs. Forty-four C-47's from the 62d and 64th Groups participated; they took off from Maison Blanche, carrying 530 men of the British 1 Parachute Brigade. Escort was furnished initially by Hurricanes and P-38's, later joined by Spits. No air opposition developing, the C-47's all came safely back. Not so the paratroops. Five days later what remained of them got back to the Allied lines—lines which had not advanced as planned—with the report: Oudna had been heavily defended; tanks and armored cars had put in an appearance. This was the last major paratroop operation in the North African campaign.<sup>75</sup>

The drive on Tunis was in fact stalled. Djedeida, it turned out, had not been completely occupied and the 36 Brigade was still involved

northwest of Mateur. Welsh ordered further attacks on enemy airfields to destroy, if possible, the enemy front-line air superiority. Anderson meanwhile prepared to resume the offensive as soon as Combat Command B, U.S. 1st Armored Division, could come up.<sup>76</sup>

A small force of B-26's from the 319th Group arrived at Maison Blanche in time for these operations, after a series of mishaps which culminated when the group commander was shot down over Cherbourg in transit from the United Kingdom to Africa. On the 28th, upon finding Kairouan airdrome unoccupied, the 319th attacked Sfax harbor from 1,000 feet, several of the B-26's coming down for strafing runs. On the 30th, nine of its planes attacked the Gabès airdrome and called on one of XII Fighter Command's DB-7's from Youks to land and rescue the crew of a B-26 shot down in enemy territory by the light flak over the field.<sup>77</sup> The DB-7's were also hammering the enemy airdromes: Gabès on the 29th and El Aouina on 1 December; the P-38's escorted them on two attacks on Djedeida, besides performing their own sweeps and reconnaissance missions.<sup>78</sup> On the 30th the B-17's, already beginning to be hampered by Tafaraoui's mud, bombed Bizerte's north quay, a target radioed back by Eisenhower from the front, but the clouds prevented more than a third of the pay load from being dropped. On the 1st, however, the 97th Group made an effective strike on El Aouina, achieving bursts on the hangar line and the built-up area of the field.<sup>79</sup>

General Anderson's offensive with Combat Command B never came off. Nehring anticipated him on 1 December, striking in the direction of Tebourba from the north. Much-battered BLADE Force withdrew towards Tebourba and Combat Command B replaced it, in a defensive role. In the early hours of the 2d, Anderson sent a worried radio back to Eisenhower.<sup>80</sup> He stated that if he did not take either Tunis or Bizerte within the next few days a temporary withdrawal was mandatory. Three factors, said the general, were responsible: administration, the enemy's air action, and his rate of reinforcement. Normal administration had been intentionally disregarded in the race for Tunis, the army and air forces working with precarious communications and no reserve supplies, their line of communication additionally burdened by the movement of French troops and stores. Anderson confirmed that what Eisenhower had feared and warned against had come to pass: the German build-up in Tunisia exceeded that of the Allies.

The British commander believed, however, that enemy air action

had exercised the greatest effect in bogging his advance; and he recognized that for "geographical reasons" his supporting air units could not deal with the situation. What Anderson referred to as enemy air action was the persistent dive bombing of his forward troops. Strangely enough, the obsolescent Ju-87's, the Stukas which had suffered so much at the hands of the RAF, ME, could claim a great deal of the credit for the First Army's discomfiture. The geographical reason for his own air forces' disability was the lack of forward airdromes.

The GAF and its satellite IAF were excellently disposed to support the defense of Tunisia. Besides their Sicilian and Sardinian bases, they enjoyed on the mainland the use of the all-weather fields at Sidi Ahmed and El Aouina and of the coastal airfields to the south at Sfax, Sousse, and Gabès. Moreover, their ground arm had seized the Tunisian plains, of which large areas were usable, almost without preparation, as landing grounds. The Germans based their Stukas at El Aouina, barely a score of miles from the front at Djedeida, and, since the plane was light, at landing grounds and in open fields just beyond the range of Allied artillery. Army calls for support, made by voice radio in the clear, could be answered within five to ten minutes.

The Eastern Air Command and the Twelfth could have demonstrated the Ju-87's obsolescence, as the Allied air in the Middle East had done, had they been able to get at it in strength. But, in late November, they were operating from just three forward fields: Bône, 120 miles from the lines, and Youks and Souk-el-Arba, 150 and 70 miles back, respectively—the last two frequently muddled. Nor could additional fields be easily located and prepared, for the Allies possessed mostly the hill country of Tunisia. From Souk-el-Arba the Spits with their 90-mile "magic circle" radius could remain over the battle area for only five to ten minutes. On their appearance the GAF pulled out over the Gulf of Tunis or landed its Ju-87's at forward landing grounds and parked them under trees. When the sweep had disappeared over the western hills, the enemy bombers resumed their work.

The P-38's at Youks found the range more convenient, but there were not enough of them for the job. Over the Allied fighters, which had to escort paratroops and bombers and to cover the coastal shipping, the Me-109's and FW-190's were consistently enjoying numerical superiority. On sweeps over the battle area the Spits and P-38's frequently were hard put to defend themselves, let alone scatter the enemy bombers. Nor was the weight of the Allied bomber force

enough to knock out the enemy air power on its airdromes, particularly since weather was beginning seriously to interfere. Besides, as Anderson mentioned, the air forces were not only overworked but undersupplied.<sup>81</sup>

On 2 December, the day after the first German counterattack, the Twelfth threw its full available force into the doubtful struggle. The DB-7's at 0810, the B-26's at 1059, bombed El Aouina where at least fifty enemy aircraft were counted and fifteen to twenty damaged. From Tafaraoui the 301st sent eighteen B-17's which bombed Sidi Ahmed and adjacent Bizerte harbor shortly after 1000 hours. The 310th Group, of which eight B-25's and crews had accumulated at Maison Blanche, ran its first mission, against installations south of Gabès, picking up escort at Youks. The P-38's made two sweeps in the northern area, broke up a Ju-88 bombing formation in the teeth of its Me-109 escort, and shot up the Stuka landing ground at Sidi Tabet.<sup>82</sup>

After the Germans, on the 3d, had again attacked at Tebourba and severely punished the 11 Brigade, Eisenhower informed the CCS that the Allied forces needed rest.<sup>83</sup> No reserves stood behind the front, and the air commanders had warned that their effort would break down completely if operations continued for as long as a week on the current scale—a scale still not sufficient to permit an advance. Existing airfields were practically bereft of all manner of supplies; maintenance troops, warning service, and AA all had to be brought forward to them; and more advanced fields had to be occupied and similarly stocked as a matter of first priority. Eisenhower hoped that these deficiencies could be somewhat remedied by 9 December, which he set as target date for a new effort. The CCS approved his plans and stressed the desirability of a vigorous assault to deprive the Axis of the Tunisian base, so that Allied forces could be freed to take increased precautions to guard the mouth of the Mediterranean.<sup>84</sup>

During the interim when the Allies would be gathering strength for their 9 December push, their bomber effort was to be switched to the ports to limit the rival build-up. On the 3d, the 97th Group had made an effective attack on Bizerte harbor, scoring on the docks and on two ships in the canal leading to the harbor and finding that the heavy flak had greatly increased in intensity. Alerted by radar, the GAF had Me-109's up and waiting; they jumped the P-38 escort at 25,000 feet, shot down three (two more were missing), and lost three of their own planes. Although it had been intended to conserve the Allied fighters

for the resumption of the advance on the 9th, the continued German dive bombing against the tired troops in the hills around Tebourba precluded any rest for the P-38's and Spits: sweeps and escort missions went on.<sup>85</sup> On the 5th, the Eastern Air Command attempted to use an advanced fighter landing ground at Medjez-el-Bab, which Anderson had hoped would alleviate the Stuka problem, but two planes were shot down landing from a sortie.<sup>86</sup> On the same day, the Twelfth's heavies bombed the Tunis docks with a very respectable degree of accuracy, and its B-25's and DB-7's attacked Sidi Ahmed, the light bombers' P-38 escort suffering substantial losses in a fight with a larger GAF fighter formation.<sup>87</sup>

Nehring attacked on 6 December and again pierced the Allied lines. On the 8th, Eisenhower approved Anderson's proposal to withdraw to a more defensible position while the troops were refitted and built up for another push. In the midst of this movement the winter rains arrived with a vengeance, rendering the terrain off the roads impassable and converting Souk-el-Arba into a mudhole. A major disaster struck Combat Command B, which became mired during the withdrawal and lost about four-fifths of its tanks and artillery. By 11 December, Anderson had retired to the general line Djebel Abiod—Medjez-el-Bab.

Although Eisenhower still hoped to take Tunis by a quick blow and planning proceeded for a time on this basis, the Allies had already lost the race. The D-day for another attack was postponed again and again by the December rains until the TORCH commander, bitterly disappointed, gave it up on Christmas Eve. The rains which glued the Eastern Air Command and the Twelfth Air Force to their bases gave a high degree of protection to the enemy build-up. What Eisenhower aptly termed the logistical marathon had begun. TORCH had failed of complete success.<sup>88</sup>

### *Pursuit of Rommel*

Meanwhile, Montgomery's Eighth Army, the victors of El Alamein,\* had advanced into Libya, preceded, in some haste, by Rommel. If, thanks to the rains on 6 and 7 November, the Axis forces in the Western Desert had been able to disengage and begin a retreat in good order, they nevertheless had suffered a defeat of enormous dimensions. The year before, Rommel had merely been forced to withdraw. His present prospects could better be compared with Graziani's in 1940,

\* See above, pp. 33-40.

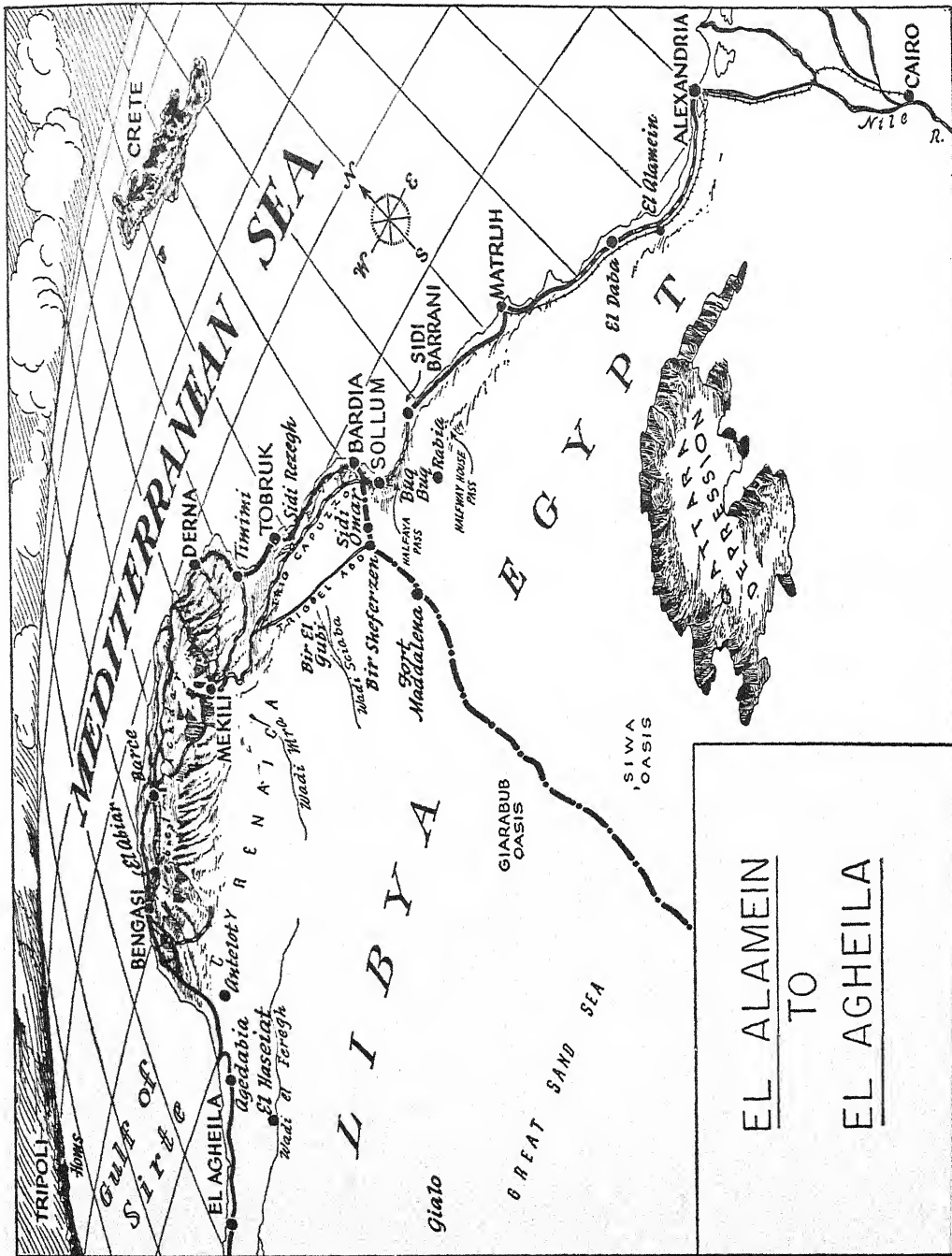
after the disastrous rout at Sidi Barrani, before the Germans had intervened in Greece and Libya.

Out of the ruck about fifty tanks had been saved. The Axis partners had suffered approximately 50,000 casualties, left 30,000 prisoners to tax the Middle East's cages. Stores and equipment in proportion had been lost.<sup>89</sup> During his previous retreat, Rommel could count on recuperating in Tripolitania while desert logistics slowed his pursuers. In November 1942 he worried lest his Tripolitanian recuperation would be marred by an Anglo-American force pouring over the Tunisian borders. To forestall such a contingency, the Axis high command was rushing troops into Tunis and Bizerte and occupying in haste the hinterland of the east-coast Tunisian ports. This expedition might fight off the threat to Rommel's rear but, since Tunisia, not Libya, was the key position in the Mediterranean, its provisioning would inevitably cut into his supplies.<sup>90</sup> His chances for a successful stand short of Tunisia were not impressive.

The Middle East's duty in these circumstances was clear. The advantage, to be fully exploited, had to be followed up and cherished. If Rommel's forces could be closely pressed, they might be brought to battle and destroyed, at least given little opportunity to recoup; their supply lines had to be dominated by Allied air and naval action, so that build-up could be kept to a minimum; where possible, aid and comfort ought to be given to forces under Eisenhower in Northwest Africa. These grand objectives had largely to be accomplished in the desert, the "quartermaster's hell," far from the Egyptian depots. The task required good management, for the amount of power mustered to defend Egypt could not be brought into play in Libya.<sup>91</sup>

Once delivered from the mud south and east of Matruh, the Eighth Army bore down rapidly on the frontiers of Libya. The 2 New Zealand cleared Sidi Barrani on 9 November, and the next night the defenders of Halfaya Pass were surprised and dispersed. Bardia was occupied on the 11th and Tobruk, largely bypassed by the retreat, on the 13th; energetic action to clear the port was at once put in hand. It was hoped that Bengasi might be taken quickly before the enemy could complete his demolitions and bring his personnel away, but the Germans were laying a carpet of mines faster than the British sappers could roll it up and, rain also interfering, the city was not entered until 20 November. By then the Axis forces were in the familiar defenses of





EL ALAMEIN  
TO  
EL AGHEILA

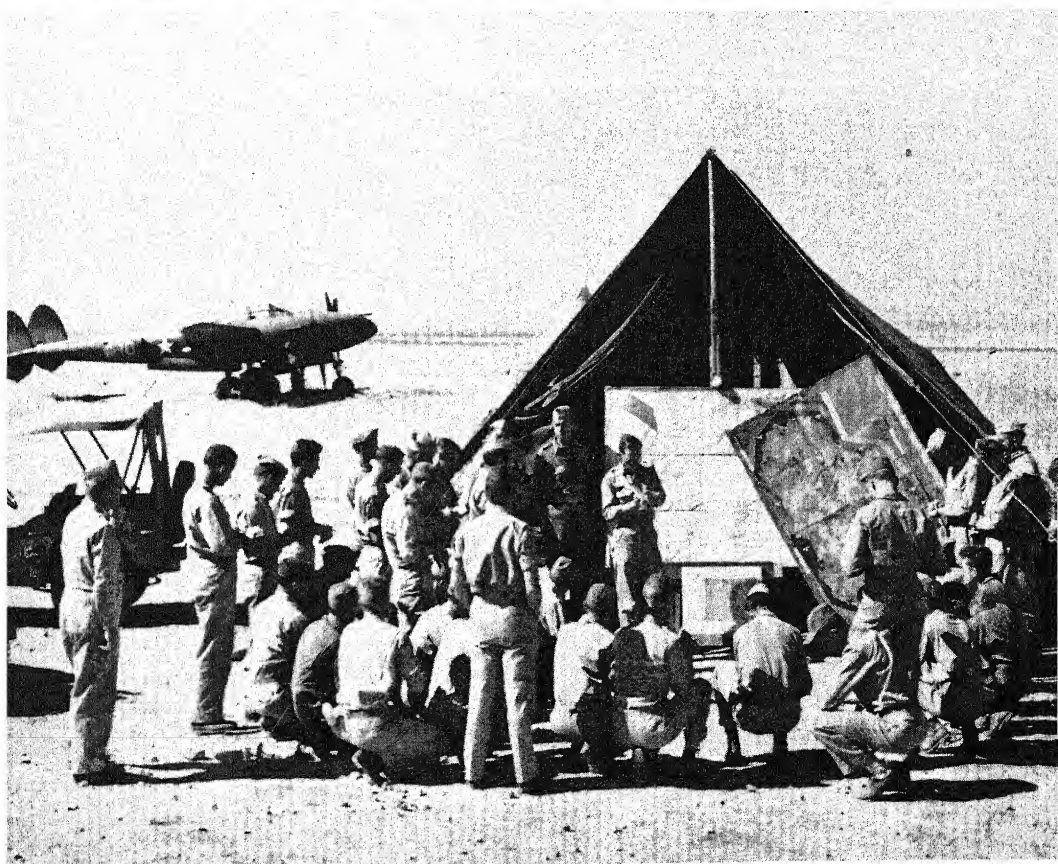


Agedabia and El Agheila, and the Eighth Army had to stop to build up for another battle.<sup>92</sup>

Although, except for his rear guards, Rommel kept his forces well out of reach of the pursuit during his career to Agheila, there was no escaping punishment from the air. By night, so long as their range permitted, RAF heavy and medium bombers attacked the roads; by day, fighters and fighter-bombers leapfrogging in the Eighth Army's train took up the burden. The Bostons and Baltimores, however, had not the range from the Egyptian fields and could neither be so easily maintained nor so expeditiously established at forward bases; they tended to drop out of the mission reports until the weight of their attack was needed against fixed positions. The fighters, fitted with extra gas tanks, became the shield of the army and the chief tormentors of the opposition.<sup>93</sup>

The rapid advance of the air forces traced not only to excellent army-air cooperation and to the fact that the RAF was well organized for mobility: landing sites were numerous in Cyrenaica and their location was perfectly known to the British, who had twice before fought over the ground. Moreover, the enemy initially decamped in such haste that he was not able to get all his serviceable aircraft away, let alone to mine or plow his airfields. Not until Derna was reached were any very formidable obstacles interposed to immediate operations from newly occupied landing grounds.<sup>94</sup>

In such wise was accomplished the long-range punishment of the retreat. During the pursuit to Agheila aerial combat became something of a rarity, as neither GAF nor IAF could stay close in any force to protect the army as had the RAF the previous June; for one thing, they had not the fuel. The 11th of November marked an exception, when the Allied air forces collided with the GAF based at Gambut and El Adem. The score reported that day: eleven Stukas, six Ju-52's, and five Me-109's, against six Kittyhawks and a P-40. The 57th Fighter Group caught and destroyed three Stukas about to land at Gambut.<sup>95</sup> The 57th's 66th Squadron had gone forward with the advance, under the operational control of No. 239 Wing, RAF. Upon reaching Gazala it received orders to join the 64th and 65th Squadrons at Martuba. By 20 November, therefore, in company with the RAF's 112 Squadron, the group was in action for the first time as a tactical unit;<sup>96</sup> between 6 November and the end of the month it carried out the impressive total of





SANDSTORM

477 sorties.<sup>97</sup> How it kept up with the advance is illustrated by the following table:<sup>98</sup>

<i>Eighth Army's Advance</i>		<i>Occupation of Landing Grounds by the 57th Fighter Group</i>	
5-6 Nov.	Fuka Escarpment	5 Nov.	Daba
8	Matruh	9	Sidi Hanaish
9	Sidi Barrani	12	Sidi Azeiz
11	Halfaya	13	Gambut
13	Tobruk	16	Martuba
20	Bengasi		

Air transports were used when long moves became necessary. The results qualified at times as spectacular. On 13 November two squadrons of Hurricanes moved into a landing ground 180 miles east of Agedabia, beyond the Axis army. Before withdrawing on the 16th, the Hurricanes were able to attack the enemy's leading columns with some effect. By that time Coningham's fighters, operating from Gambut, had designs on the Ju-52's, which, because of the dearth of M/T and fuel, were being extensively employed in the evacuation of Bengasi. Nearly forty aircraft, mostly transport, were reported destroyed in the two days succeeding.<sup>99</sup>

It was a foregone conclusion that once its armies were broken in Egypt the Axis would find Cyrenaica untenable and would again seek refuge in the Agheila defenses, Tripoli then becoming the main port of entry. Consequently, plans were early developed to bring IX Bomber Command within range of the Libyan capital, and the army accepted the added strain on its LOC.<sup>100</sup> The two heavy groups had already moved their permanent stations from Palestine to Egypt—Abu Sueir, Fayid, and El Kabrit—and had bombed Tobruk and Bengasi as long as there was profit in it. As a forward base LG 139 at Gambut offered the desired facilities.<sup>101</sup>

LG 139, or Gambut Main as it was known, had been a major Italian air base, convenient to Tobruk, some thirty miles west along the coast road, and six miles from a railhead. Shortly before the Italians left they had thoughtfully joined two adjacent fields and so provided IX Bomber Command with well over the 2,000-foot runway its heavies required. Late in November a small camp was built by a detachment from the 98th Group, with spare tents set up for combat crews which might be benighted there. Gambut's fuel added over 300 miles to the B-24's tactical radius; Tunisia, Sicily, and Italy now could be included in the command's targets.<sup>102</sup>

The first blow at Tripoli was a double one on 21 November. The first mission hit a ship, which was being towed smoking from the harbor entrance when the 376th Group came in a few hours later to lay bombs on the principal mole. The RAF's 160 Squadron presently beginning night attacks, Tripoli attained the status of a regular port of call.<sup>103</sup> IX Bomber next reached out for Naples. On 4 December, twenty B-24's attacked the docks and Italian fleet units in the harbor. The crews claimed hits and near misses on shipping, and preliminary reconnaissance supported them, showing a cruiser lying on its side and extensive damage to harbor installations. On the next visit, a B-24 was brought down by AA, and the subsequently strengthened Naples defenses began to remind the veteran 160 Squadron of nights over the Ruhr.<sup>104</sup>

As early as 18 November, while Eisenhower was still at his Gibraltar command post, he had received a radio from Andrews saying that he intended sending Brereton to establish personal contact with the Northwest African command,<sup>105</sup> and on the 25th, Tedder, Brereton, and Timberlake took off for Malta, where they were received at Luca airdrome by Air Vice Marshal Sir Keith Park. Park conducting a tour of the island, Brereton and Timberlake saw that it would be impracticable to base B-24's on Malta as Brereton had suggested in his August strategic estimate. Although every level space on the island appeared to have been converted into a landing ground, only asphalt-surfaced Luca was big enough to handle heavy bombers. Park then accompanied the party to the Algiers conferences.<sup>106</sup>

While a tightening aerial noose was being prepared for the Axis forces in Africa, Montgomery was considering ways and means of occupying Agheila, the gateway to Cyrenaica, the springboard from which the Axis had twice rebounded to threaten Egypt. Except for having flanked the enemy out of Agedabia on 23 November, after the capture of Bengasi the Eighth Army had been mostly concerned with its build-up. At first the bulk of its stores had to be trucked from Tobruk, but by 1 December, Bengasi was handling nearly 1,000 tons daily, a figure which had doubled two weeks later as intensive efforts were expended on increasing capacity. By the end of November, Montgomery was touring the forward area, developing a plan.<sup>107</sup>

The strong Agheila position presented Rommel with his first opportunity for a successful stand, and had he been able fully to exploit its potentialities, the Eighth Army might have been tested severely. Heavily mined, it covered the desert between the sea and the Wadi



Faregh, south of which lay a large area unsuitable for maneuver. Montgomery decided to bypass this difficult area by a wide detour to the south and push his New Zealanders to the coast behind the Germans. The flanking movement would be coordinated with a two-division frontal attack.<sup>108</sup>

The British intended to move on 14 December and began preparations—large-scale raids and heavy air and artillery action. Lacking mobility (fuel) to counter the flank attack which he feared—he and Kesselring had told Goering in Rome on 30 November that the position could not be held—Rommel began to pull out on the night of the 12th, with the 90th Light as his rear guard. Nevertheless, on 15 December the 2 New Zealand, swinging into the coast from the desert, found the 90th and most of the enemy armor still to the east. Menaced by the 7 Armoured at its back, the rear guard broke into small detachments and won through; but it lost 20 tanks and some 500 prisoners.<sup>109</sup>

The American components of the Western Desert Air Force were especially active during these operations. The P-40's had joined with the RAF's light bombers in preliminary assaults on the enemy landing grounds around Marble Arch, which attacks had the effect of driving the enemy air force ninety miles behind the Agheila line.<sup>110</sup> Once the enemy broke to the west again, there were good targets along the coast road, although not to compare with those after Alamein. On the 15th heavy formations of USAAF B-25's and RAF Bostons and Baltimores hit motor vehicle concentrations on the coast road west of Marble Arch. Next day the 12th Group bombed again, in the Nufilia area, where on the 17th the New Zealanders had a sharp engagement with the Axis rear guard. At this point, contact with the enemy was lost, both in the air and on the ground, administration and the scarcity of landing grounds being responsible. Rommel went back to Buerat el Hsun.<sup>111</sup>

By mid-December, by checking the Allies in the Medjerda valley, the Axis forces in Tunisia had temporarily secured Rommel's rear. Moreover, the Tunisian ports were replacing bomb-battered Tripoli as Rommel's main dependence for supply: Middle East estimates showed he was already drawing less than half his daily maintenance requirements through the Libyan capital and the intake there would probably lessen as the larger ships abandoned the run. By 12 December the Axis had decided that Tripoli was too near the front for big ships. Tunis, Bizerte, Sousse, Sfax, and the railroad to Gabès took on new im-



portance on the Cairo maps.<sup>112</sup> In these circumstances the cooperation between the Middle East's air forces and those under Eisenhower in Northwest Africa, set under way and fostered by Tedder's visits to Algiers (he undertook another in mid-December), began to get concrete results. Cables began arriving at Twelfth Air Force from Brereton inquiring what airdromes in Northwest Africa were available for crippled B-24's and requesting that diversions be flown for IX Bomber's attacks on Tunis or Sfax.<sup>113</sup>

An earnest of this cooperation was the appearance in the Western Desert of the 93d Bombardment Group (H), attached to the Ninth Air Force by orders of 18 December.<sup>114</sup> The 93d had been borrowed by AFHQ from the Eighth Air Force, had run a pair of missions against Bizerte from Tafaraoui, and was lent by the Twelfth Air Force because its long-range B-24's could be better employed in the Middle East.<sup>115</sup> On 16 December, General Timberlake was on hand at Gambut to welcome the 93d and its commander, his brother, Col. Edward J. Timberlake. The 93d took over Gambut Main, and the advance base of the Delta groups had to be moved to LG 159, five miles west; the 12th Group, in turn displaced, transferred to LG 142, not far away.<sup>116</sup> As part of the transaction involving the 93d, nine ancient B-17's which Brereton had brought from India were sent to the Twelfth Air Force. Their limited range and different performance characteristics had made them unsuitable for combined operations with the B-24's. Their last mission in the Middle East had been against Portolago Bay in the Dodecanese on 27 November; on that occasion the crews had reported fires and explosions and hits on two merchant vessels.<sup>117</sup>

The Ninth Air Force's campaign against the Tunisian ports opened most auspiciously on 15 December when nine B-24D's of the 376th Group obliterated the roundhouse at Sfax.<sup>118</sup> Thereafter until Christmas bad weather played hob with operations. But when it cleared after the holiday, Tunis, Sousse (where three merchant vessels, the *Armando*, *Anna Maria*, and *Giuseppo Leva* fell victim to the B-24's), and Sfax were attacked and the 98th celebrated New Year's Day by dropping HE on Tunis harbor.<sup>119</sup> The Twelfth Air Force's bombers in January started a specialized effort against the coastal railroad, which, however, did not yield spectacular results.<sup>120</sup>

Meanwhile, an excursion of some proportions was being planned to the Cretan airfields from which issued the bombers attacking the Malta convoys and the harbors at Tobruk and Bengasi (from the advance

base at Gambut, IX Bomber Command could watch the fireworks attending the night raids on Tobruk). For this operation, which could be expected to draw GAF fighters away from Tunisia and Sicily, the B-25's of the 12th Group came under operational control of IX Bomber Command, and 205 Group's Baltimores at Derna were to cooperate. What befell the B-25's on this mission was not untypical of the hazards of operations from a desert.

The 12th Group had prepared for three weeks. Since fighter protection was not possible to so distant a target, a high-altitude (19,000 feet) attack was chosen. To gain that altitude it was necessary to remove the dust screens from all engines. About a quarter of an hour before take-off on 2 January up blew a dust storm, and only twelve of a projected thirty-six B-25's got away; of these one turned back. Eleven bombed; two, force-landing at sea, were lost (RAF Air Sea Rescue saved the crews); and, excessive gas consumption being general for one reason or another, several others made land but not the base. Fifty engine changes were necessary after the dust storm. The B-24's and Baltimores redeemed matters somewhat by blasting Suda Bay and Tymbakia and Kastelli Pediada airdromes.<sup>121</sup>

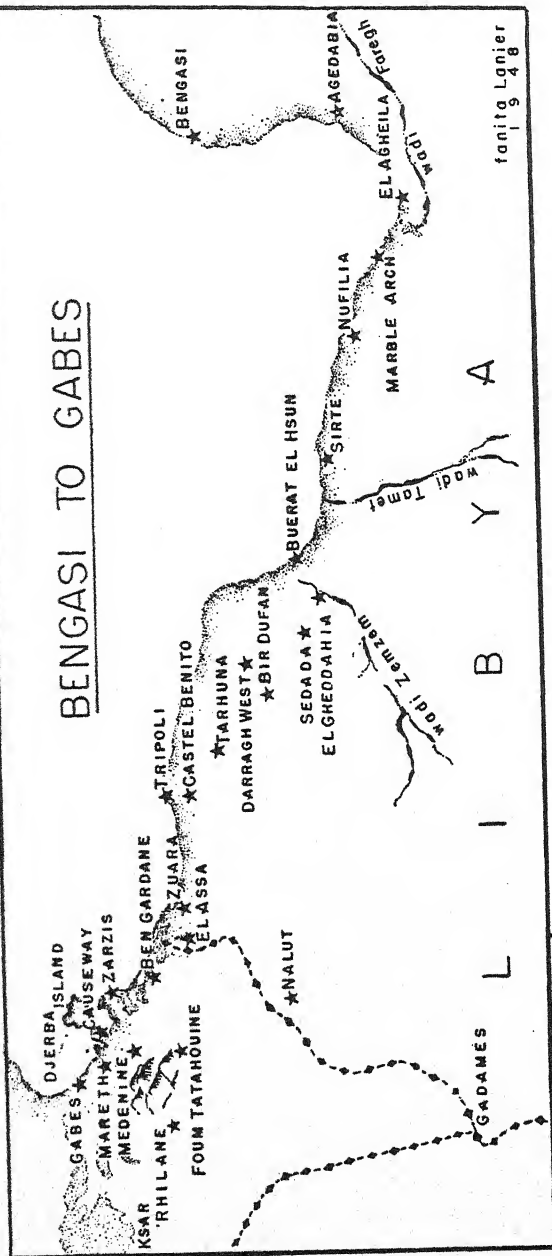
The passing months had wrought some changes in the Ninth Air Force. On 4 January 1943, Adler turned over to Col. Robert Kauch an air service command considerably enlarged from the organization of June 1942 which had existed largely on paper. Two new service groups, the 306th and the 315th, had arrived and were assigned to the heavy groups in the Delta. Rayak had been abandoned in favor of Deversoir, on the canal, a station which was manned by the newly arrived 26th Depot Group, and the 323d Service Group was now operating an advance depot in support of the Desert Air Task Force. The Ninth Air Force even had a troop carrier group, the 316th, which, making an appearance late in November under Col. Jerome B. McCauley, sensibly improved desert mobility, as the British were at the time very short of air cargo planes. Halverson had been gone since August, and on 1 November the 1st Provisional Group had been metamorphosed into the 376th Bombardment Group under his successor, Lt. Col. George F. McGuire. The activation of the 376th was a by-product of an abortive plan to send an Anglo-American air task force to operate from the Caucasus, the 316th Troop Carrier Group having been standing by in the States for this project before it was finally ordered into the Middle East.<sup>122</sup> In the other heavy bomber group, the 98th, Col. John R. Kane

had succeeded Rush as commander. The combat force had been augmented by two new fighter groups, the 79th and 324th, which were going through the same careful training prior to commitment as had the 57th. Anglo-American cooperation was, if anything, improving, Andrews reporting to Marshall on 9 January that the British commanders in chief had taken him into their complete confidence.<sup>123</sup>

After the German collapse in 1945, when Field Marshal Gen. Wilhelm Keitel was asked the reasons for Rommel's failure in Africa, he specified the breakdown of supply; and for this he ungallantly blamed the Italians. Had they used small, fast warships on the Libyan run, all would have been well. Merchant vessels with their lengthy turn-around<sup>124</sup> had given the Allied bombers too much opportunity. Besides, said Keitel, the bombers crippled the disembarkation point of Tripoli.<sup>125</sup> A contemporary RAF study,<sup>126</sup> "The Enemy's Last Days in Tripoli," bore out the field marshal's memory. The F-boat had been the most effective cargo carrier, and of twenty-eight merchant vessels in the harbor from 21 November to 22 January at least six were damaged during bombing attacks. The first B-24 missions on 21 November damaged two unloading vessels and considerably disarranged the warehouses on the Spanish mole. One of these vessels was hit again by the B-24's on the 26th and her unloading suspended for several weeks. The next B-24 visitation on the 29th damaged two 5,000 tonners, the *Sirio* and the motor vessel *Giulia*: one burned for two days and both were finally abandoned. After 15 January, the bombers were given the unusual job of sinking once-sunk hulks which were being pumped out for use as block ships. In the end, however, the Axis did succeed in blocking the harbor mouth.

Unlike Cyrenaica, Tripolitania presented some difficulty to the RAF in the matter of landing grounds. The terrain was not so favorable and the enemy performed well with mine, booby trap, and plow. Late in December when the Eighth Army was moving up to the Buerat defenses, the landing grounds at Tamet and Sirte required so much time to clear that the forward RAF squadrons were moved to prepared fields at Hamraiet. At this point, the GAF and IAF, which mustered about 450 aircraft (mostly fighters) in Tripolitania, mounted a series of attacks on airfields before the Allied air had got well established. Discouragement of these activities blended naturally into the customary establishment of air superiority before the Eighth Army's attack. The 57th Fighter Group and the 12th Bombardment Group (M) partic-

# BENGASI TO GABES



ipated in these operations, during which the enemy fighters gave a particularly good account of themselves in a stubborn defense of the Bir Dufan landing grounds. Tripoli receiving no ships after 2 January, RAF Liberators and Wellingtons began paying particular attention to the roads leading south from Tunisia.<sup>127</sup>

Although the Axis forces at Buerat were weak and in an unsound defensive position in which they had no intention of making a determined stand,<sup>128</sup> the Eighth Army also had its problems, imposed mainly by supply. It had to turn the enemy out of Buerat, give him no respite in the good defensive ground farther back, and take Tripoli in a rapid advance before the British stores gave out. A two-day January storm at Bengasi worsened the situation by so battering the harbor that the burden of supply was thrown back on the Tobruk road. Nevertheless, the attack opened on schedule on 15 January and on the 16th was through the main Axis position, of which no serious defense was attempted. By 17 January a twin-pronged advance moved swiftly on the approaches to Tripoli.<sup>129</sup>

Montgomery was bending every effort to get forward before his supplies gave out, and it was especially imperative that the RAF keep its fighters in force ahead of the troops. This involved a very high degree of mobility and army-air cooperation. The standards reached could not be better illustrated than by the events at Sedada on 17 January. Sedada was about halfway to Tripoli from the Tamet-Hamraiet airfields and had been selected as a landing-ground site before the attack began. When it reached the area around nightfall of the 16th, 7 Armoured Division's spearhead had with it a landing-ground party. Next morning the armor left eighteen to twenty of its Bofors, trucks, and an ambulance unit with the landing-ground party at Sedada. By 0900 the strip was ready for two squadrons of fighters which escorted in a transport with the radar and immediate requirements. Having flown in on their auxiliary tanks, they were ready for action. Two other squadrons meanwhile had flown on to bomb the enemy columns retreating toward Tripoli on the Tarhuna track, and the transports bringing in fuel and ammunition began flying back the army wounded collected by the ambulance unit; next day the process was repeated.<sup>130</sup> The 57th Group, which had put in three days of bombing and strafing on the traffic north of El Gheddahia, was moved in this manner to Darragh West on the 18th.<sup>131</sup>

On 17 January it was discovered that the backtracking enemy air

force had imprudently crowded Castel Benito airfield, just south of Tripoli, with almost 200 aircraft. RAF, ME not only advised AFHQ, which ordered a B-17 attack on the 18th, but turned its own bombers on.<sup>132</sup> Fifty went in on the night of 17/18 January, and on the next night the 12th Group joined with Bostons and Baltimores to keep up a series of attacks which continued through the 21st.<sup>133</sup> By the 22d the enemy air was being hammered at the Medenine and Ben Gardane airfields in Tunisia;<sup>134</sup> and on 23 January the Eighth Army completed an epic 1,400-mile journey by entering long-coveted Tripoli.

With the fall of Tripoli, IX Bomber Command's attention narrowed to a trio of ports which became its steady objectives for some time to come—Naples, Messina, Palermo: Naples, the chief onloading port for Tunisia; Messina, to which the trains for Sicily were ferried across from the rail lines converging on the Italian toe; Palermo, where cargoes carried from Messina for the sake of the shorter sea haul to Tunisia were unloaded. At Messina the chief target was the tall curved building housing the machinery which unloaded entire trains from the six specially constructed ferries plying the strait from slips at Reggio di Calabria and San Giovanni.

As routine as the targets was the technique employed to attack them. Crews were briefed in Egypt, proceeding thence to Gambut where the B-24's were refueled. The bombers took off in the late morning, assembled, and steered for Cape Aamer where the Libyan coast was crossed. The course then led to a portion of the Italian mainland where RDF cover had not been installed and on to a point in the Tyrrhenian Sea equidistant from the three targets. Bombing at last light, the planes broke away to seaward: fighters were noticeably less aggressive over the water. As dusk fell the formations disbanded and the B-24's individually negotiated the long homeward flight. Landing at Gambut before midnight, the crews gave a brief account of the mission and in the morning were off again for the Delta. If a plane was crippled or its fuel low, Malta was on the direct line home, and Luca airdrome soon exhibited a regular contingent of ailing B-24's. In March the Ninth Air Force sent Luca a small detachment of mechanics.

Late in January the Egyptian fields (with the exception of Fayid retained as a repair base) were abandoned, and IX Bomber Command migrated en masse to Gambut, eliminating the extra engine hours involved in the 300-mile shuttle from the Delta. The 376th joined the 93d at LG 139 and the 98th was divided between LG's 140 and 159.



Command headquarters dug in at a site between LG's 139 and 159. Bombing continued during the move with the exception of respites enforced by the seasonal winter rains.<sup>135</sup> By the end of January, the Eighth Army was at the Tunisian frontier and Montgomery was meditating operations against the outposts of the Mareth Line.<sup>136</sup> Before that line was breached, however, the Ninth Air Force and the RAF, ME had undergone fundamental command changes necessitated by the merging of the Middle East and Northwest African theaters of war.

## CHAPTER 4

\* \* \* \* \*

### *THE WINTER CAMPAIGN*

ON 29 November, the day of the optimistic paratroop drop at Depienne, General Spaatz went down to Portreath in Cornwall. Next morning he left by air for Gibraltar and on the 1st of December landed at Tafaraoui where XII Bomber Command officers informed him that, except for Tafaraoui, the area was under XII Fighter Command's headquarters at La Senia, that XII Bomber Command's area lay farther east, and that the Casablanca region was in charge of XII Air Support Command. Doolittle, by now a major general, had put his territorial organization into operation, although no general orders had been issued.<sup>1</sup>

It was Spaatz' second trip to Africa since the landings. On 17 November he had flown to Gibraltar upon Eisenhower's invitation and gone on to make an inspection of the African theater during which he remarked the B-17's exposed position at Algiers.<sup>2</sup> His main purpose, however, had been to discuss the theater air force organization which had been hotly favored by Arnold and finally approved by Eisenhower just before Forward AFHQ moved to the Gibraltar command post.\*

During that first visit, Spaatz had achieved substantial progress, so much that AAF Headquarters assumed that the theater air force was an accomplished fact.<sup>3</sup> It had nevertheless been necessary to shift the rationale somewhat. Spaatz' original plans had set forth the standard AAF doctrine that Germany was the principal enemy and proposed that the flexibility of the theater air force be employed with the paramount end of subjecting the Reich to heavy strategic bombardment, an air war on Italy to be a secondary objective. Eisenhower perused the plans briefly on 18 November and suggested some changes. Possibly, in view of the uncertainty of the direction of Allied strategy, he objected to the low

\* See above, pp. 60-66.

priority given an air war on Italy. At any rate, Spaatz left his most experienced planners, Hansell and Brig. Gen. Laurence S. Kuter, to re-write the justification for the theater air force while he went on his inspection, and the revised draft omitted any reference to the priorities of Germany and Italy as targets for air bombardment.<sup>4</sup>

Even so, Eisenhower hesitated to go ahead until the Tunisian bases were secured, and apparently it was the arrival of a letter from Arnold which finally decided him. Reorganization day was set for 1 December.<sup>5</sup> Spaatz went back to England, planning to return to Africa for a month's stay. When he landed at Tafaraoui on the 1st, he must have expected shortly to take command of the theater air force, as Eaker that day took command of the Eighth.<sup>6</sup>

### *Emergence of the Allied Air Force*

Much had happened in the interim, however, to make Eisenhower wary of appointing Spaatz immediately to the position of commander of the AAF in ETO. Nehring's forces, far from showing signs of collapse, had stopped Anderson's advance and were about to throw in a damaging counterattack. On the other hand, except for Tunisia, the Northwest African theater had been pacified. These developments invalidated the separate air commands enjoined by the TORCH plan. It was obvious that both the Twelfth Air Force and the Eastern Air Command would have to be used in the same area—and in collaboration with the RAF, ME and RAF, Malta in a common campaign to rid Tunisia and Tripolitania of the Axis. Logically, the answer lay in unified command.

This was quickly realized in London, and on 19 November, at the behest of the British, the CCS called for the views of interested parties on the subject of combined air command in the Mediterranean.<sup>7</sup> Moreover, while Spaatz had been back in England, Tedder, with Andrews' blessing and accompanied by Sir Keith Park (the AOC RAF, Malta) and by Brereton, Timberlake, and Col. Uzal G. Ent, had visited Algiers to urge that the system of area commands in Northwest Africa be superseded by an air command for the entire Mediterranean.<sup>8</sup> With his Malta and Gambut bases striking at the common enemy, Tedder could demonstrate that the efforts of the Middle East and Northwest Africa were at least as complementary as those of the United Kingdom and Northwest Africa. The British chiefs of staff, sharing this view, urged that Tedder be accepted by Eisenhower as his air commander.

This suggestion was reiterated on 3 December,<sup>9</sup> evidently as part of a protest against the appointment of Spaatz on that day to the relatively modest position of "Acting Deputy C-in-C for Air, Allied Force."<sup>10</sup> In rebuttal, Eisenhower pointed out that his problems were immediate, not permitting of delay while the optimum air organization was studied; that Tedder could not well serve with two ground commanders; and that Spaatz' appointment was as a staff officer, not as a commander, and therefore did not interfere with the prerogatives of the CCS. AFHQ expressed a wish to postpone the question of Mediterranean air command.<sup>11</sup> Spaatz wrote back to Eaker and Stratemeyer that clarification of his status awaited clarification of the Tunisian situation.<sup>12</sup> As air officer of ETOUSA, of course, he still controlled the Eighth Air Force and thus he performed such tasks as dividing B-17 replacements between the Eighth and Twelfth, urging on Eaker the necessity of expediting the Twelfth's aircraft, and ordering Eighth Air Force units into Africa.<sup>13</sup>

At AFHQ, however, Spaatz' chief duty became the coordination not of the Eighth with the Twelfth but of the Twelfth with the RAF's Eastern Air Command, for the air command arrangements prescribed by the TORCH plan had broken down in fact as well as in theory.<sup>14</sup> Since it had not been anticipated that the Twelfth and the EAC would be operating so soon from the same area, such coordination of their efforts as might be necessary had first been the responsibility of Eisenhower and his assistant and deputy assistant G-3 for air. This simple arrangement became impracticable when substantial elements of the Twelfth began moving eastward, to Maison Blanche and beyond. The integration of their efforts with the EAC was then given over to Welsh, logically enough, since it was on his territory and resources that the Twelfth was impinging. Doolittle had moved into Algiers from Tafaraoui, but his headquarters was separate from Welsh's at Maison Carrée outside the city, from Admiral Cunningham's aboard ship in the harbor, and from AFHQ at the St. George Hotel. Welsh's principal subordinate, Air Cdre. G. M. Lawson, was with the First Army at Philippeville.<sup>15</sup>

This dispersion of headquarters might have been borne had communications throughout the theater not been appalling. Welsh could not command the American squadrons, and so had to work through Doolittle; frequently this involved traveling considerable distances for personal conferences. Moreover, an AFHQ directive had subordinated

the available forward air forces, both RAF and USAAF, to the pressing needs of the drive for Tunis; this meant that the First Army had practical command over the aircraft. It resulted in misuse of air power: for instance, apparently on the day after Spaatz' appointment, a whole squadron of the lightly armed Bisleys was lost on an unescorted daylight attack on a Stuka base ordered by a ranking ground officer over the protest of the RAF wing commander. Neither Doolittle nor Vandenberg felt that the early employment of the B-17's against airfields rather than ports was justified (the Luftwaffe also thought that the Allied air forces would have been better employed at this point against the Tunisian ports).<sup>16</sup> This situation might have been more excusable had Anderson taken Tunis in his first lunge, but it could not be allowed to endure in any sustained campaign. Such were the immediate problems Spaatz faced as Eisenhower's deputy.

By 4 December exercising, as he put it, only the authority that Eisenhower would normally try to exercise himself, Spaatz had switched the heavy bomber effort from airdromes to ports, ordained some rest for the weary air forces, and achieved a rough division of labor between the EAC and the Twelfth whereby the former was generally to cooperate with the ground forces and the Twelfth to concentrate on "strategic" bombing, i.e., ports. By 12 December detailed air command arrangements had been made for the renewal of Anderson's drive, which were remarkable chiefly in that they delivered all available tactical aircraft, RAF or USAAF, to Lawson's control once the drive had begun. But these arrangements were never tested in battle.<sup>17</sup>

Eisenhower spent most of the remainder of 1942 in a vain effort to extricate his forces from the mud before Mateur and Tebourba for a decisive blow at Tunis.<sup>18</sup> Although the closest cooperation was maintained with RAF, ME, Tedder, who had attended organization conferences at AFHQ in mid-December, persisted in his belief that a unified air command for the whole Mediterranean was needed. Finally, at the end of that rainy December which buried hopes for the immediate capture of Tunis, Eisenhower, increasingly receptive to Tedder's ideas, took advantage of the lull in the ground battle to straighten out his air command.<sup>19</sup>

On the 31st he proposed to the CCS that Spaatz be set up directly under AFHQ as commander of the Allied air forces in Northwest Africa; he stressed that the utilization of British and American units in

the same area required such a step. At the same time, he proposed to leave the full unification of air effort in the Mediterranean to a later CCS decision.<sup>20</sup> To this measure the reaction of the British chiefs was favorable.<sup>21</sup> They pointed out, however, that Spaatz' chief of staff should be an RAF officer and that his staff should include a senior RAF officer well qualified in maintenance and supply.

As to the subdivisions of the unified air force, the British chiefs made some suggestions which seemed fairly revolutionary, although the pattern had been partially established in the Middle East—that British and American air units be grouped according to their functions, tactical requirements, and logistic possibilities, regardless of nationality. They recognized the AAF's aptitude for daylight strategic bombing but considered the RAF especially capable in the support of land and sea forces, general reconnaissance, and the operation of night fighters. They proposed therefore that an American head a subcommand engaged in strategic bombing and that he control the necessary escort fighters—Doolittle's XII Bomber Command was already using this system. A second subcommand, under an RAF officer, would employ general reconnaissance and day and night fighter aircraft for port defense, shipping protection, and cooperation with the Royal Navy. A third subcommand, likewise under an RAF officer, would devote itself to cooperation with ground forces. Attached to it would be light bombers, fighters, and army cooperation squadrons.

On 4 January, Eisenhower reported to the CCS his essential agreement with the British plan. But he stated that he meant for the present to preserve the continuity of the Eastern Air Command and the Twelfth Air Force. The old organizations had already solved many of the difficult administrative problems peculiar to the theater, and, as he put it, the areas in which AFHQ was currently interested with respect to ground operations were widely separated.<sup>22</sup> He intended, however, to assign functions in general accord with the British recommendations. EAC would control a general reconnaissance and striking force to hit shipping at sea and a day and night fighter force to defend the ports and back areas. Through a subordinate command (Lawson's No. 242 Group) it would be responsible for close cover and cooperation with the First Army. To the Twelfth was assigned the task of carrying out strategic bombardment with heavy and medium bombers and the double duty of cooperation with American ground forces in Tunisia and, if need be, in Morocco.



In closing, the TORCH commander stated that in view of the "relatively minor" differences in the plans and because of the necessity of immediate action he was organizing forthwith. Next day, 5 January, he activated the Allied Air Force, and Spaatz passed from air adviser to air commander over the EAC and the Twelfth. Air Vice Marshal J. M. Robb became his chief of staff. Spaatz' directive did not change his relationship to the Eighth Air Force, over which he retained his old control under ETOUSA. His duties were to coordinate the operations of the Eighth with those of the Allied Air Force, to cooperate with RAF, ME, and when necessary, to divide replacement aircraft among the Eighth, Twelfth, and Eastern Air Command.<sup>23</sup> The Allied Air Force represents the link between the U.S. theater air force which had been projected for the post-TORCH period and the Northwest African Air Forces which later emerged as the answer to the organizational needs of the continuing African campaign.

That the Allied Air Force was a stopgap and a compromise should not obscure its merits. It satisfied Eisenhower's conviction that the Eighth Air Force was necessary to the fortunes of TORCH. By placing a common commander over the Twelfth and the EAC, it ended the *de jure* separation decreed by the TORCH plan—a separation long since rendered anomalous by the course of events in Africa. Its great failure lay in the fact that no central direction had been provided for the tactical or "air support" air forces facing the Tunisian bridgehead, but this deficiency was to be remedied within three weeks—at the plans level by a CCS decision and at the operational level by the necessities of battle.

During the last two months of 1942 the Twelfth Air Force also was in process of adjusting to the changing requirements—tactical and strategic—of the African campaign. In those days the planners, air and ground alike, labored under severe handicaps. They could not be sure from day to day whether Tunis would fall or hold out, or whether peace or war would prevail around Gibraltar. Yet each combination of circumstances called for different commitments and consequently peculiar organizational patterns.

Doolittle's reaction to these early uncertainties was his concept of area composite commands exercising both tactical and administrative control over the major base areas and prepared, in any emergency, to operate both bombers and fighters. This concept he did not put into effect officially until 11 December, although he had broached it to

Arnold almost a month earlier,<sup>24</sup> one cogent reason for the delay being that he was under the necessity of locating and developing eastern fields for his fighters and bombers. On 11 December,<sup>25</sup> however, XII Bomber Command was established in the new air base area south of Constantine, which city was designated its headquarters. Its territory extended from Bougie east to the Tunisian border except for XII Fighter Command's sector (which Welsh had assigned) in the Tebessa-Feriana region. Existing organizations were drawn upon for the other composite commands: 51st Troop Carrier Wing furnished the cadre for the Central Algerian Composite Wing in the Algiers area; XII Fighter Command's rear echelon became Western Algerian Composite Wing at La Senia; and XII Air Support Command fathered the Moroccan Composite Wing at Casablanca. According to the Twelfth Air Force's administrative historian the Central Algerian Composite Wing never really functioned; nor did the Moroccan Composite Wing come to life until the end of December, in the meantime entering into a series of intricate relationships with XII ASC. At one point Cannon commanded both organizations.<sup>26</sup>

Dunton's XII Air Force Service Command, on the other hand, since its responsibilities in the major base areas were more constant, was able to set up agreeably with the order of 11 December the elements of a stable organization. Its own order of 14 December<sup>27</sup> merely legitimized three service area commands already operating in the areas controlled by Moroccan Composite Wing, Western Algerian Composite Wing, and XII Bomber Command. Cols. Harold A. Bartron, George H. Beverley, and Ray A. Dunn, respectively, took over command of the Casablanca, Oran, and Constantine service area commands (provisional). Service units in the Central Algerian Composite Wing's area operated directly under the headquarters of XII AFSC, which had been moved from Oran to Algiers on 13 December. With minor changes in designation and location, XII AFSC organization remained substantially as above throughout the Tunisian campaign, although subsequently an attempt was made to organize a fourth service area command for the Algiers area. The three existing commands were respectively redesignated 1st, 2d, and 3d Service Area Commands (Prov.) on 23 December.<sup>28</sup>

The key to the understanding of the subsequent organization of the Twelfth lies in Eisenhower's appreciation of the developing situation in the Mediterranean and his plans for destroying the Axis in Tunisia.

In respect of the Strait of Gibraltar, he had tended to weaken the American forces kept in readiness for action against Spanish Morocco in order to help on the initial drive for Tunis, relying on the England-based Northern Task Force for insurance against a hostile move.\* Moreover, after his repulse in December on the muddy Medjerda route to Tunis, he pulled additional American units eastward for use in the drier area of central Tunisia against Rommel's communications in the Sfax-Sousse-Gabès region.<sup>29</sup>

The date 5 January 1943 was important in the organizational history of the Allied Force. Not only was Spaatz' Allied Air Force created but at Oujda, in the northeastern corner of French Morocco, Lt. Gen. Mark Clark activated the American Fifth Army.<sup>30</sup> One of Clark's responsibilities at the time was to prepare for a possible BACKBONE II, combined action of his command and the Northern Task Force against Spanish Morocco.<sup>31</sup> The Twelfth Air Force, whose chief task in the beginning had been to cooperate with just such an operation, was initially committed to the extent of furnishing three fighter groups, if the necessity arose. To control these groups, on 6 January the Detachment, XII Air Support Command, was set up under Col. Rosenham Beam. It consisted initially of a headquarters, an air support communications squadron, a provisional air support signal battalion, and the 68th Observation Group.<sup>32</sup> On 1 March the Detachment, XII ASC, was relieved from attachment to the Fifth Army,<sup>33</sup> and long before that time the danger to the strait had appreciably diminished.

The changing complexion of the North African theater was reflected in another reorganization accomplished on 5 January. Doolittle's General Order No. 3, announced that the composite wings—Moroccan, Central Algerian, and Western Algerian—would be replaced by the 2d, 1st, and 3d Air Defense Wings, respectively, upon the arrival of these organizations from the United States. The three air defense wings were put under the jurisdiction of XII Fighter Command, which was giving up its sector forward of Tebessa.<sup>34</sup> Western Algeria and Morocco had taken something of the character of back areas. Later, the air defense of Algiers was reassigned to the RAF and the wing thus displaced was eventually attached to XII Air Support Command in central Tunisia.<sup>35</sup>

XII Air Support Command was designated as the air force contingent for Fredendall's II Corps, which Eisenhower was moving into the

\* See above, p. 50.

Tebessa region with a view to striking a blow in a sector more favorable to winter operations. Previously, XII ASC had been relatively inactive, engaged in administering the Moroccan area, and the 33d and 310th Groups originally assigned to it had passed through to the active front in the east. General Cannon was transferred to XII Bomber Command at the end of December, and XII ASC was then briefly under Beam (30 Dec.-1 Jan.) and Col. Peter S. Rask (1-10 Jan.). On 10 January, General Craig, formerly AFHQ's deputy assistant G-3 for air, took command—with the prospect of an early test of American techniques of air-ground cooperation.<sup>36</sup>

### *The Casablanca Conference*

On 14 January the President and the Prime Minister came together at the Anfa camp on the outskirts of Casablanca. There for ten days the state of the war and designs for its vigorous prosecution were considered by the Combined Chiefs of Staff in the wide terms of global strategy, the task not lightened by the nonattendance of the U.S.S.R. In the nature of the case, plans and prospects for the African campaign played a leading role in the discussions.

Most important strategically was the decision to exploit the African lodgment and deployment by further Mediterranean offensives. The previous lack of such a decision at the highest level had exercised a muddying effect on contemporary planning: the planning subcommittee of the CCS wasted three weeks in November and December trying to devise a recommended course of action subsequent to TORCH, finally giving up when it was apparent that there was no agreement even as to the general strategic area for future offensives.<sup>37</sup> From the AAF point of view, one of the best features of the theater air force during the uncertainty of the winter of 1942-43 was its flexibility, the assurance it offered that, whatever projects were finally undertaken, U.S. air resources would not be parceled out to subordinate ground commanders but fought according to the airman's principles of mobility and economy of force and in relation to the total, not the local, situation.<sup>38</sup>

The decision to continue the Mediterranean strategy did not come without argument. The U.S. Joint Chiefs hewed to their preference for a 1943 cross-Channel operation, and, although they did not prevail on this point, the British receded from an earlier contention that Sardinia, not Sicily, was the proper next objective in the Mediterranean. In the

end it was decided that HUSKY, the assault on Sicily, would be undertaken during the favorable July moon or, if possible, during the corresponding favorable June period.<sup>39</sup>

In accordance with the primary strategic decision and in view of the progressive *de facto* fusion of the Middle East and Northwest African theaters, the CCS at Casablanca prescribed new command arrangements for the Mediterranean. For HUSKY, the present naval commander of X Force, Fleet Admiral Cunningham, was to assume the title of Commander in Chief, Mediterranean, the incumbent of that position to become Commander in Chief, Levant. At an unstipulated time after the Eighth Army had crossed the Tunisian frontier, General Alexander was to be designated Eisenhower's deputy commander in chief and the Eighth Army would pass to AFHQ's control. Subject to Eisenhower's approval, Alexander's immediate task thereafter would be to direct all Allied ground forces on the Tunisian front.<sup>40</sup>

The CCS also agreed on an over-all air command for the Mediterranean by adopting the substance of the proposals the British chiefs had previously made to Eisenhower. Tedder was chosen as air commander in chief. Under him were to be two principal subordinates, an air commander for Northwest Africa (Spaatz) and an air commander for the Middle East (Air Chief Marshal Sir Sholto Douglas). The broad outlines of Spaatz' command, the future Northwest African Air Forces, were specifically laid down.

Spaatz would have at his disposal the Western Desert Air Force, the Twelfth Air Force, and the Eastern Air Command. From these elements he was required by the CCS to form three main subcommands—a heavy and medium bomber force with appropriate escort fighters, a coastal air force for port and shipping protection, and a tactical air force or air support command. The last was to work in conjunction with General Alexander and to comprise the three air detachments cooperating with the main ground forces bent on destroying the Axis bridgehead, the British First and Eighth Armies and the U.S. II Corps. It was generally agreed that Coningham would command this new tactical air force. The date for implementing the new organization was not specified and important details were left to be worked out, but thereafter air organization in Northwest Africa followed a master plan.<sup>41</sup>

General Arnold had arrived at Casablanca in hopes that the unity of strategic air operations in the United Kingdom-North African-

Middle East areas would be recognized in the new command system. He conceived of these regions as one vast encircling "horseshoe area" from which Allied air power could strike at Axis Europe utilizing whatever point on the perimeter was best favored by seasonal weather and convenience to the targets of current strategy. Once the North African bases had been captured and furnished with the facilities for servicing a mobile heavy bomber force, true strategic mobility could be achieved and the strain on the IAF and GAF increased by the necessary dispersion of their defense efforts.<sup>42</sup>

The air force Arnold projected for the horseshoe area could not be reconciled with the strategic decisions arrived at by the Casablanca conferees. Nor was opinion at the conference universally favorable to the U.S. doctrine of strategic bombing; in fact, the Eighth Air Force, pioneering in the application of that doctrine, was under attack. Eaker was called down from England. He managed to convince Churchill that the Eighth's ineffectiveness was no fault of its own and that the proposed conversion of its heavies to night operations would be impracticable and wasteful. Once this crisis was passed, the Eighth was treated generously at Casablanca. On 21 January the CCS issued a directive on the bomber offensive from the United Kingdom. This document assured the continuance of daylight bombing from the United Kingdom and freed Eaker's force to a large extent from the exigencies of aiding TORCH. Hereafter the Eighth went its own way in England.<sup>43</sup>

The formal separation of England and Africa came later when Headquarters, North African Theater of Operations, United States Army, was established on 4 February under Eisenhower's command. American forces in England remained in ETOUSA and Andrews was brought in from the Middle East as commander. The control of Eisenhower and Spaatz over the Eighth Air Force ceased. The setting up of NATOUSA symbolized and implemented the Casablanca decision that the imminent attempt to break into the European fortress was to be made in the Mediterranean, from the African springboard. From England, for the time being, only an air offensive would be mounted.<sup>44</sup>

### *New Air Bases*

By 14 December 1942 the Axis establishment in Tunisia numbered an estimated 38,500 men—nearly 20,000 German combat troops and over 11,000 Italian, together with 2,500 GAF and 5,000 service troops.



Substantial increments were arriving daily. By the 18th the estimated total had risen to 42,100. Not only did these enemy forces lack for little but an abundance of extra supplies was going down from Tunis and Bizerte by rail to Sfax and thence by rail, by road, and sea to Rommel in Tripolitania. In the north, Col. Gen. Jürgen von Arnim, the new enemy commander in Tunisia, was defending his lodgment along a line west of Mateur-Tebourba-Mohamadia with local attacks employing armor and infantry. With patrols and defensive positions west of Zaghuan and Kairouan, he protected the coastal corridor to the south. Defense of central and southern Tunisia was an affair of outposts and motorized cavalry at Djebel Krechem and Kebili and south of the Mareth Line at Medenine and Fom Tatahouine.<sup>45</sup>

At this point, Eisenhower was still in hopes of striking a decisive blow in the north to avoid settling down to the "logistical marathon." He had set 20 December as the date of another try for Tunis. But the weather, worsening after mid-December, frustrated his plans, and the possibility of a major offensive in the north passed over until March. He turned his attention to preparing operations in central Tunisia and to methods of limiting, in the interim, the Axis build-up. The air forces, whose part in these endeavors was expected to be considerable, meanwhile were working hard to remedy one of their greatest problems, the scarcity of airfields.<sup>46</sup>

It had been Anderson's opinion that the lack of airfields within convenient fighter radius of the front had been responsible for his check early in December. A report of the distribution of Allied aircraft at that time (the 5th) showed that all suitable fields, front and rear, were being used to capacity. Bône held 76 fighters; Youks, 37 (besides 9 DB-7's); and Souk-el-Arba, 45. Canrobert and Djidjelli, some distance back, together had a total of only 19 fighters and light bombers, but in the Algiers area Maison Blanche and Blida together counted 150 aircraft, and four fields around Oran had 180, mostly at Tafaraoui and La Senia. Even two weeks later, when a great improvement had been made, Doolittle estimated that of 600 planes at his disposal only about a third could be effectively employed at one time against the Axis.<sup>47</sup>

The pre-invasion plans had specified that the British were responsible for the development of airfields from Algiers eastward as their offensive moved on towards Tunis.<sup>48</sup> They brought in two airfield construction groups, Nos. 14 and 3, and detachments of the former were by 20 November working in the area of Souk-el-Arba. The British

were baffled, however, with the onset of the rains in the Medjerda valley. They laid Sommerfeld mat, well suited to the English sod fields, but at Souk-el-Arba it simply sank in the mud. An underlayer of cork was added; it buckled, and the Spits proceeded to rip up chunks of runway. No better success was had with bamboo rushes. Pierced steel plank might have served; but enough for a 5,000-foot runway weighed 2,000 tons,<sup>49</sup> and Eisenhower explained that 2,000 tons would have taken up the entire capacity of the railroad in the forward sector for a whole day.<sup>50</sup> (At Christmas time two of the pierced steel plank runways received in Africa were either laid or being laid in the back area, at Mediouna and Rabat-Salé, and the third was on its way by sea up the Tunisian coast.<sup>51</sup>) Eventually, the solution in the Medjerda valley grew out of a local Frenchman's remark that he had a field which never became waterlogged. Its soil was sandy, and the British fields were subsequently built on a number of sand outcrops in the Souk-el-Khemis area.<sup>52</sup>

The Twelfth Air Force arrived in Africa with responsibility for airdrome construction and maintenance around Casablanca and Oran, and it was anticipated that the Twelfth would push its area of responsibility eastward in the wake of the First Army.<sup>53</sup> Two battalions of the 21st Engineer Regiment (Aviation) with its headquarters and service company and two companies of the 871st Airborne Engineer Battalion landed with XII ASC in Morocco. The airborne engineer unit had been activated especially for TORCH at Westover Field, Massachusetts, on 18 August, and only the utmost dispatch had got the two companies ready by the sailing date.<sup>54</sup> Four aviation engineer battalions came in at Oran, the 809th, 814th, 815th, and 817th. Brig. Gen. Donald A. Davison, formerly engineer for the GHQ Air Force, was engineer on Eisenhower's staff, and Col. John Colonna and Lt. Col. Henry Hoeffler were engineers on the staffs of Twelfth Air Force and XII ASC, respectively.<sup>55</sup>

Despite its sizable contingent of aviation engineers the Twelfth did not immediately make much headway against the airdrome shortage in the battle area. With its primary responsibility for the Oran and Casablanca regions, where the fields sadly needed attention, it was required in addition to prepare bases facing Spanish Morocco. (A string of border fighter fields was readied and kept stocked until the end of the Tunisian campaign: Oujda, Meknès, Ras el Ma, Fez, Taza, and Guer-cif; and the Mediterranean Base Section built heavy bomber bases in

the Oran region.<sup>56</sup>) During November the only U.S. aviation engineers working as far east as Algiers were a detachment of the 809th which arrived at Maison Blanche on the 29th. Meanwhile, a good deal of equipment had been lost or appropriated by other units, and off Oran a sub had put a torpedo into a ship loaded with bulldozers and other machinery.<sup>57</sup>

The hurry call for eastern airdromes came around the 1st of December. Doolittle was anxious to get his B-17's out of Tafaraoui and his mediums out of Maison Blanche. Tafaraoui's two incomplete hard-surfaced runways ranked as luxurious facilities in Africa, but the surrounding earth was a mass of sticky mud after the frequent rains and no aircraft could be moved off the runways except at the risk of being glued in. Maison Blanche had only one macadam runway, plenty of mud, and was invariably congested.<sup>58</sup> Visitors to the theater were always struck by the conditions at Oran and Algiers. One general reported that all the airdromes in Africa presented perfectly uniform aspects: if a field boasted two hard-surfaced runways, the longer would be employed as a hardstand, the other, cross-wind, for landing—and the rest of the landscape was muck.<sup>59</sup>

It was known that the plateau between the Saharan and maritime ranges of the Atlas Mountains was somewhat drier than along the coast, and on 2 December, Davison, reconnoitering in the interior, located a suitable small field at Telergma in the Rhumel valley. By the 13th, Arabs, French troops, and aviation engineers had finished a dry-weather field for the mediums, the first B-26 coming in on that day. Work was also got under way on additional fields in the neighborhood.<sup>60</sup> However, for his heavies, Doolittle wanted an all-weather airdrome. For that, recourse was had to the desert itself, at Biskra, an oasis and winter resort beyond the Saharan Atlas. The airborne engineers were picked up in Morocco by C-47's and set down to enlarge the desert field. On 13 December it was ready for the B-17's. In anticipation, XII Bomber Command planned to move forward two squadrons apiece of the 97th and the 301st from Tafaraoui to Maison Blanche and Blida, where they apparently operated for a time before moving down to their new home. Although dusty, Biskra was a good bomber base, its huge runway allowing three B-17's to take off abreast. The climate could be expected to be favorable during the winter, but a south wind off the Sahara would be blowing by mid-March and so it was planned eventually to send the heavies to the Telergma area. The use of the air-

borne engineers at Biskra was successful and spectacular, but farther east they were given a job beyond the capabilities of their light equipment. It took one company fifteen days to construct an earth field at Tebessa; and before a battalion with heavy equipment was sent forward an appreciable delay had occurred in the construction in the important Tebessa region.<sup>61</sup>

To add to other handicaps, command difficulties arose. The battalions were under the "operational control" of the engineer, Twelfth Air Force, but orders for construction had to be issued from headquarters of XII AFSC to the appropriate service area command. Despite the fact that Colonna was also engineer, XII AFSC, his control was not as absolute as the tactical situation demanded, and debate as to the assignment of U.S. aviation engineers went on for some time. No difficulty was experienced during this early period in integration with the First Army's airdrome construction groups primarily because the British were fully engaged in their own areas along the coast and in the Medjerda valley.<sup>62</sup>

On 3 December, Eisenhower, considering his available bombers too few to do much to limit the enemy build-up, signified his intention of seeking their augmentation from the United Kingdom or the Middle East. Welsh thereupon requested two squadrons of Wellingtons from the Air Ministry, which referred him to Tedder. Tedder, however, felt unable to spare the aircraft; and in the end the metropolitan RAF furnished Nos. 142 and 150 Squadrons, which moved down to Portreath for staging on 9 December, landed at their Blida base on the 19th, and had commenced night bombing before the end of the month.<sup>63</sup>

The Eighth had long been preparing its groups for temporary duty in Africa, such employment being the core of the theater air force plan. On 5 December, Eaker, acting on Spaatz' instructions, ordered the air echelon of three squadrons of the 93d Group (B-24's) to move out, its period of operations in Africa to be approximately ten days. The 93d arrived at Tafaraoui on the 7th, its group historian, fresh from England, registering the opinion that the base was unfit for operations.<sup>64</sup> The 93d did not stay long at the much-maligned field. Three scheduled missions were called off on account of rain and a fourth canceled when one of the first B-24's to start taxiing collapsed a nose wheel in the mud. On the 13th, however, Bizerte was attacked and one B-24, badly shot up, crash-landed at Maison Blanche. Next day the 93d ran its last mission for the Twelfth Air Force when twelve B-24's again attacked Bizerte,

straddled a ship in its harbor, hit the docks, and claimed three Me-109's shot down.<sup>65</sup>

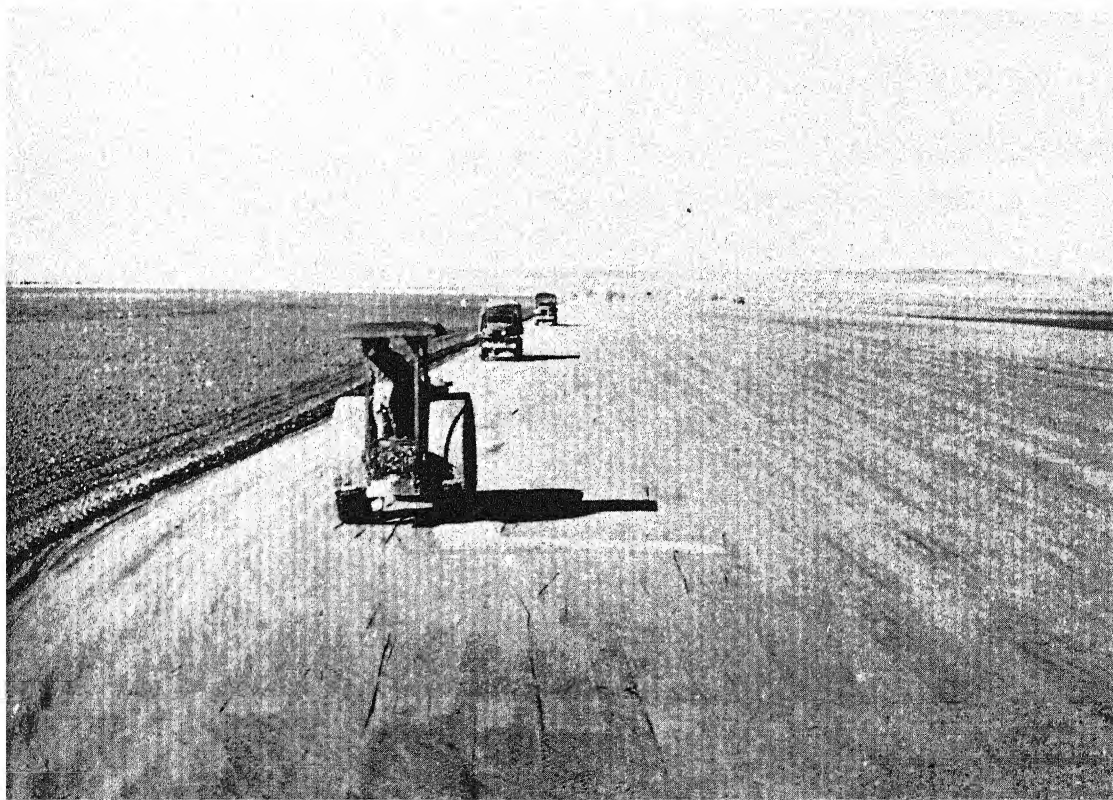
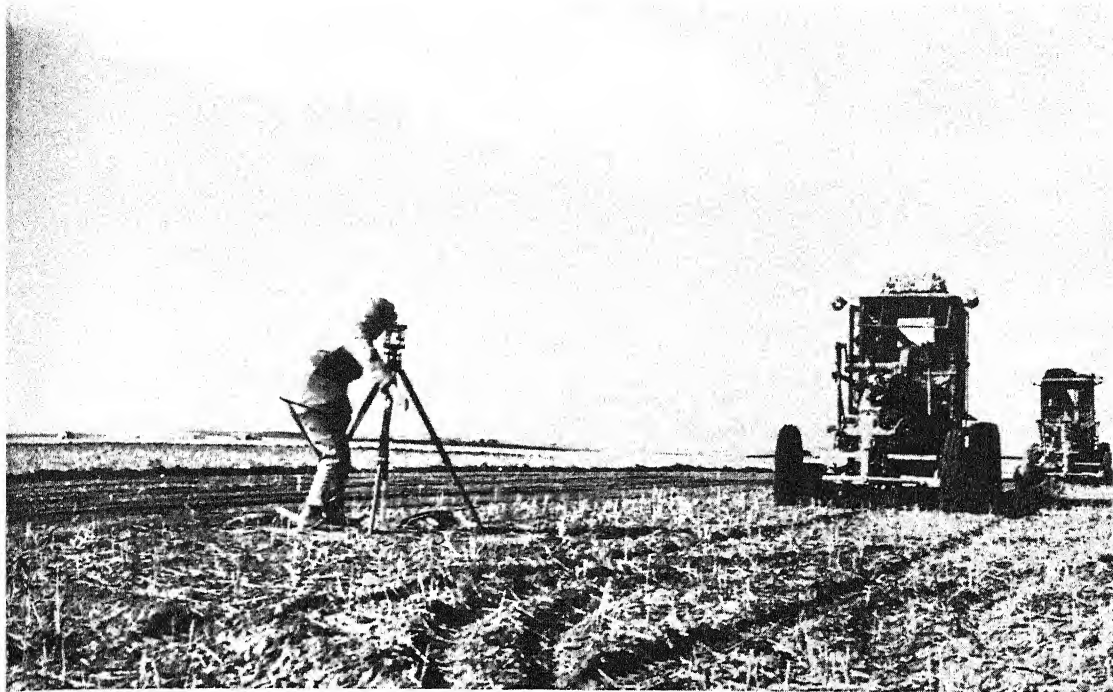
After this brief sojourn in Algeria, the 93d Group departed for the Middle East, pursuant to an agreement Spaatz had negotiated with Brereton and Andrews by which the Ninth Air Force's 513th Squadron (B-17's) would be shifted to Northwest Africa in return.\* The 93d could be more useful in Libya where the B-24's superior range permitted strikes at Naples and Palermo. The B-17, on the other hand, was altogether suitable for operations from Algeria against Tunis and Bizerte. The exchange of three squadrons for one probably reflected Spaatz' difficult logistics and airdrome shortage—which prevented him from ordering in the two remaining Eighth Air Force heavy groups earmarked for TORCH, the 91st and 303d.<sup>66</sup> He did attach a proviso to the Ninth Air Force's use of the 93d: the group's overriding targets were to be those affecting the Tunisian campaign. On 15 December it left for Gambut.<sup>67</sup>

During its first seven weeks in Africa, XII Bomber Command had a total of four commanding officers. By 24 November, Duncan, who had brought the organization down from England, had been relieved and Col. Charles T. Phillips, heading the Eighth Air Force 3d Wing, was being requested as his replacement.<sup>68</sup> Phillips took over around 11 December, only to be killed on a B-26 mission against El Aouina on the 15th. Bomber Command headquarters had been successively moved from Tafaraoui to Algiers to Constantine and Col. Carlyle H. Ridenour assumed command on the 16th. On New Year's Day, Cannon was brought over from XII ASC, and he continued in charge of XII Bomber until 18 February.<sup>69</sup>

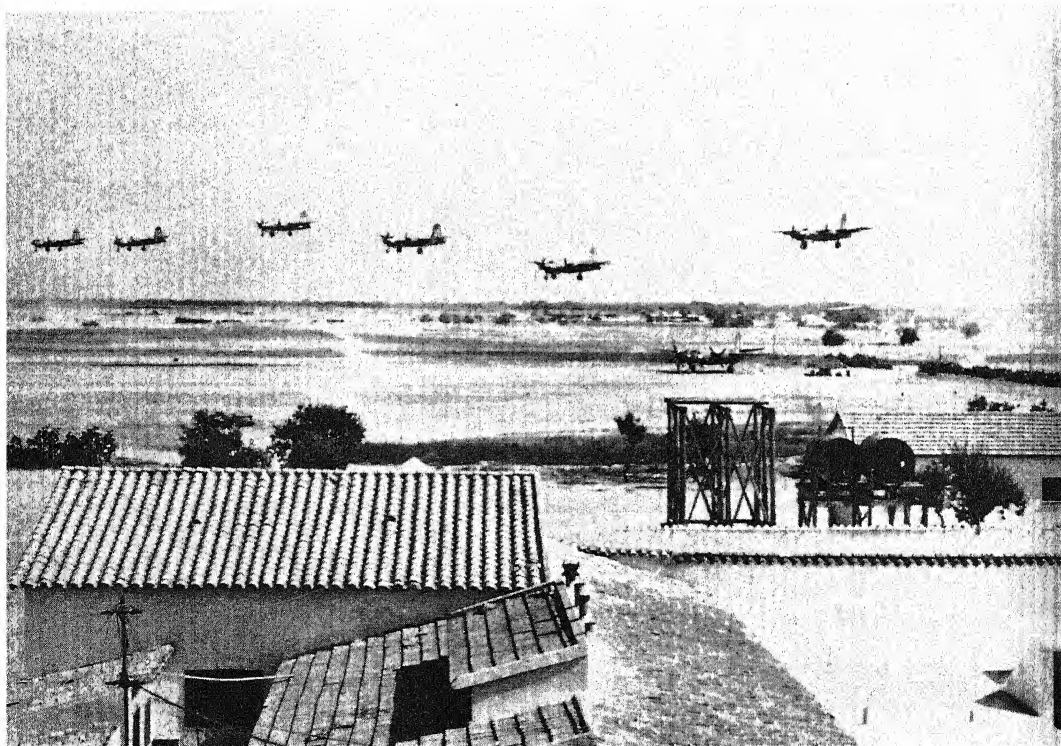
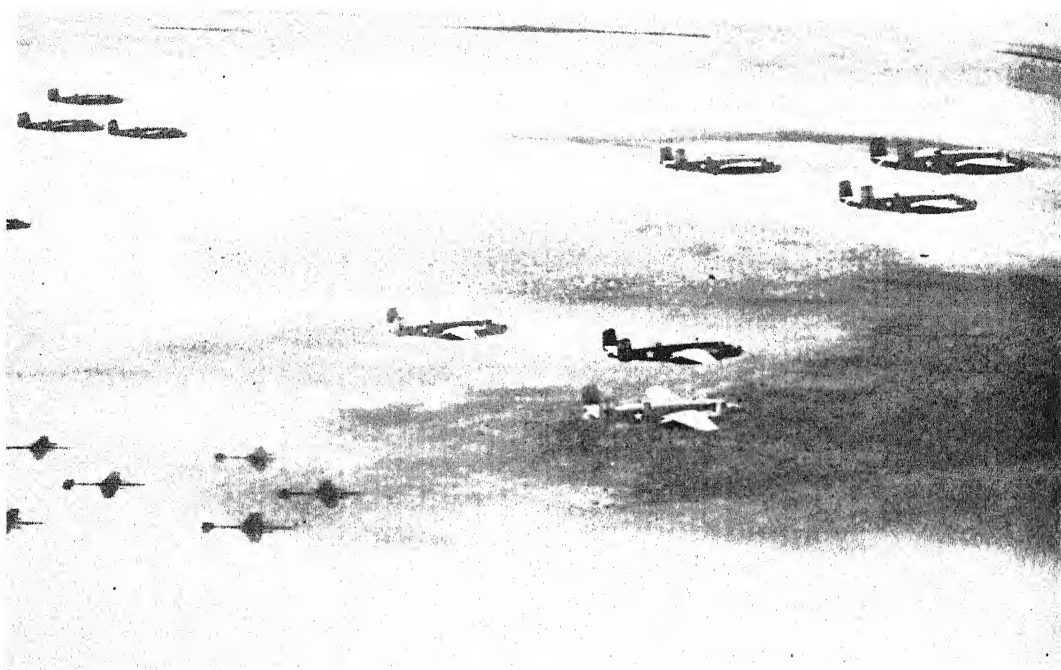
In his position as Eisenhower's deputy, Spaatz had earned the gratitude of the Twelfth Air Force by his efforts to get its purloined transportation back from the ground forces and by his representation of the airman's point of view at AFHQ. In one particular, however, the December routine at AFHQ worked unfavorably for the Twelfth's operations. Not only the specific objectives for the following day but the time over target and number of attacking aircraft were determined by a daily war-room conference at 0900 attended by representatives of the Twelfth, AFHQ, the RAF, the Royal Navy, and of Spaatz' staff. This procedure, although an improvement over complete control by Anderson, converted Twelfth Air Force and XII Bomber Command into

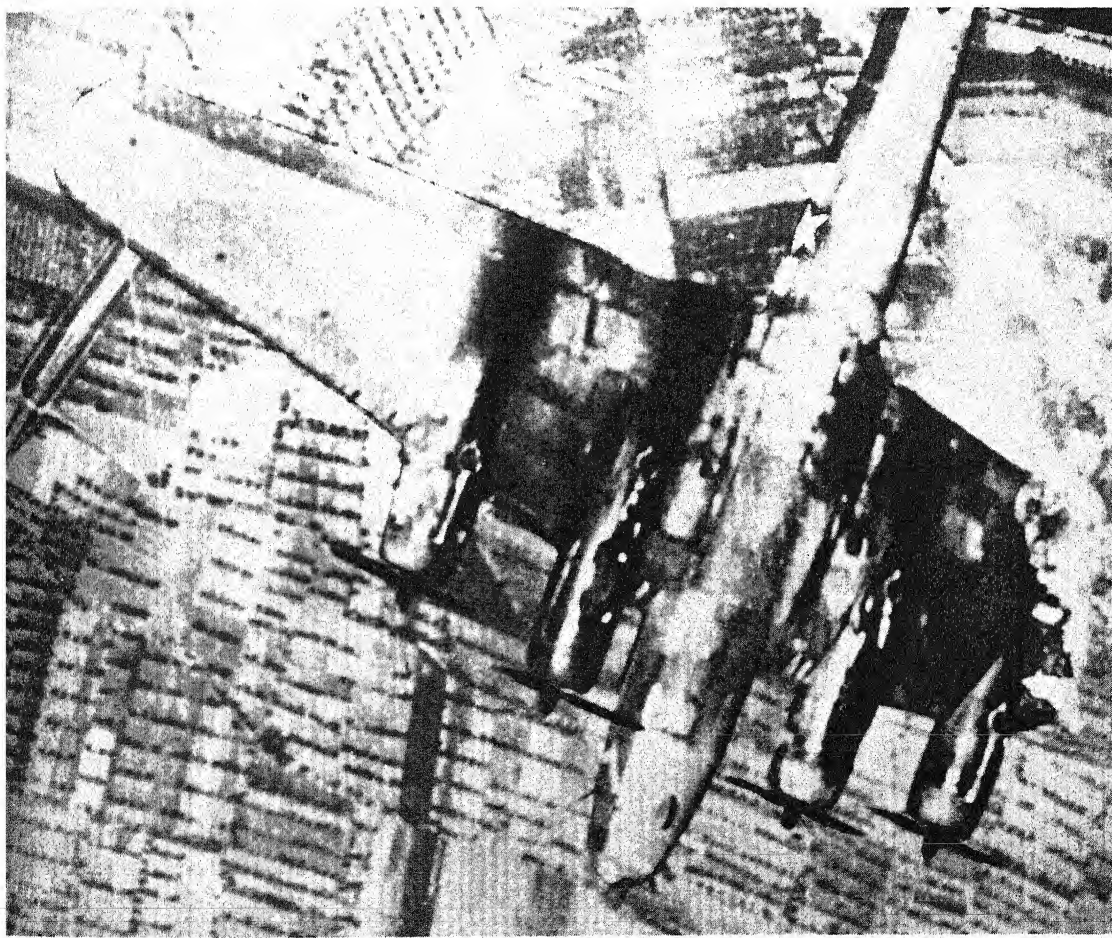
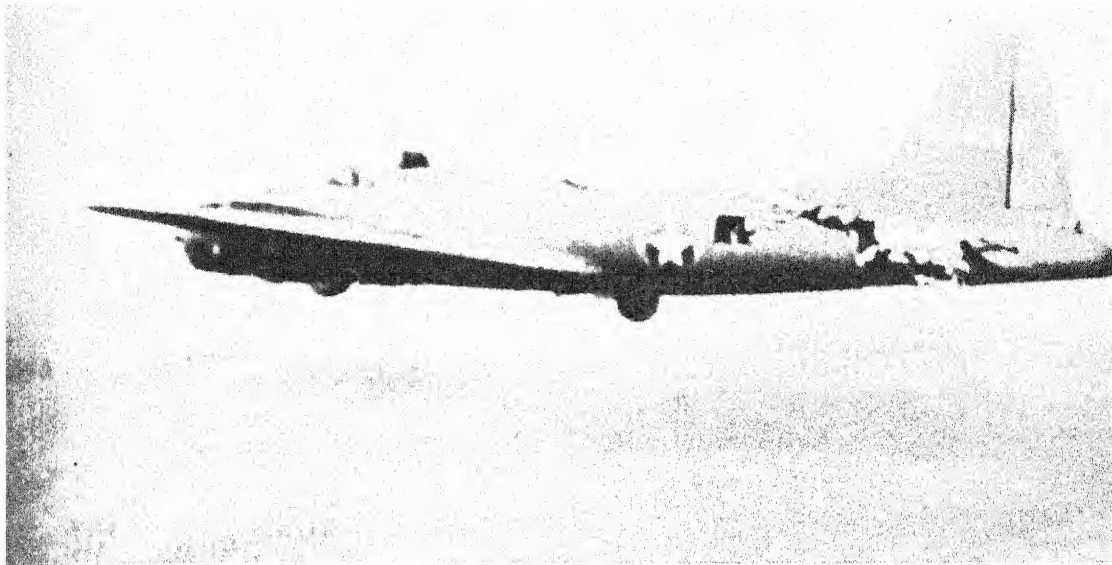
\* See above, p. 98.











THE RUGGED B-17



agencies which did no more than pass on orders to the unit commanders. These, in turn, seldom received the orders in time to select proper bombs and fuzes, so bombs were loaded and fuzed a day in advance and dropped on whatever target was later designated. By 27 December this procedure had been abandoned and the Twelfth was given a directive which allowed it some latitude.<sup>70</sup>

If, however, the heavies' pay loads had been preselected and fuzed for ports and shipping each evening, little would have been lost the next day, because during December and early January the bomber command mostly confined itself to the harbors at Tunis and Bizerte, undertaking strikes against Sousse and Sfax when weather or unusual enemy activity favored them as targets. Daylight pounding of Tunis and Bizerte was nearly exclusively the B-17's job, the ports having become too hot for medium or light bombers. No longer, as in the first days of December, did the DB-7's visit El Aouina or the mediums the Bizerte docks, although occasionally mediums attacked difficult targets when B-17's were along to saturate the defenses.<sup>71</sup>

As operations go, the early missions had not been costly: in fact, on 30 November, Doolittle reported that only eight Twelfth Air Force aircraft had been shot down by enemy planes and twelve by ground fire, friendly or hostile. Seven had been lost on the ground by enemy bombing and strafing and forty-nine through miscellaneous and unknown causes. This last, Doolittle admitted, was "rather appalling," but it had been predicted that wastage from crashes, disappearances, and internments would be high in TORCH. Personnel losses had been relatively slight; pilots regularly walked home and the Arabs received considerable sums of blood money.

But after their fields had recovered from the rainy spell which set in on 8 December, the Allied airmen found that the Axis had put the respite to good use. The B-17's discovered new and formidable yellow-nosed FW-190's at Bizerte, and flak so markedly increased that Tunis and Bizerte soon compared with the more heavily defended targets in northwestern Europe.<sup>72</sup> The Twelfth's B-17's attacked Tunis and Bizerte day after day, going in with forces which seem pitifully small in comparison with the armadas of 1944 and 1945. That their losses remained low must be attributed to the fact that they usually had P-38's escorting, not many P-38's but enough to divide the opposition's attention. Moreover, the German pilots had not evolved any very satisfactory way of attacking the heavily armed B-17, and they were properly

respectful. For example, on 15 December two formations were sent out from Biskra for simultaneous attacks on Tunis and Bizerte. Six P-38's accompanied seven B-17's bound for Tunis; another six escorted the dozen heavies which could be mustered for Bizerte. All aircraft returned despite flak and enemy fighters, and according to an investigation of the port after its capture, with one 500-pounder the Tunis contingent sank the 10,000-ton Italian freighter *Arlesiana*. On the 18th, however, at Bizerte, four escorts and a bomber were shot down (another B-17 crash-landed at Le Kef) out of a formation of sixteen P-38's and thirty-six B-17's. Thirty-three of the bombers had attacked the target; the remaining three dropped on two naval vessels between Cap Zebib and the Cani Islands.<sup>73</sup>

Thereafter, until 26 December, foul weather plagued XII Bomber. On the 21st at Sfax and Gabès and on the 22d at Bizerte, Sousse, and Sfax, 10/10 cloud prevented an attack. On the 23d, seventeen B-17's of the 301st Group, escorted by eleven P-38's of the 1st, took off for Tunis and Bizerte. Five bombers returned early after encountering cumulus and icing at 25,000. The targets were completely shrouded, and four wandering B-17's turned up at distant airdromes, Tafaraoui, Nouvion, and Relizane.<sup>74</sup>

By the end of December, XII Bomber Command organization began to take form, incorporating one feature novel in bomber commands: the escort fighters were attached. Between 14 and 18 December, two squadrons of the 1st Fighter Group (P-38's) moved to the bomber station at Biskra and came under the control of XII Bomber. Part of Doolittle's regime of composite commands, this innovation did away with the necessity of coordinating each mission with a fighter command headquarters, and the P-38's presence on the bomber airdrome simplified such problems as rendezvous. The step seems to have been well suited to the operating hazards in Africa, especially to the miserable communications which Doolittle rated on 30 November as the chief bugbear of efficient operations.<sup>75</sup> The system worked to the satisfaction of USAAF commanders, but, later, Coningham and other observers came to believe that continual employment of fighters as escort detracted from their efficiency in their primary role. The fighter pilots tended to regard themselves as stepchildren of the bomber command.<sup>76</sup>

In the early days, the bomber command passed down directly to the units the operational instructions for the missions. As the available groups became more numerous, however, wings were interposed. For



this purpose the wing headquarters originally attached to XII ASC were utilized. On Christmas Day, Col. J. H. Atkinson, commanding the 97th Group, was promoted to brigadier general and later made commander of the 5th Bombardment Wing (Heavy), the organization gradually assembling at Biskra in mid-January. Moreover, shortly after New Year's, personnel of the 7th Fighter Wing headquarters in Morocco were alerted for a move eastward, and on 7 January, Ridenour replaced Col. John C. Crosthwaite as commanding officer. On 1 February the 7th began operating at Châteaudun-du-Rhumel, near Constantine, as a medium bombardment wing, an arrangement solemnized when it was redesignated 47th Bombardment Wing (Medium) on 25 February.<sup>77</sup>

After Christmas, the bad weather having worn itself out for the time being, the B-17's turned their attention chiefly to the east-coast ports of Sfax and Sousse, which were building up supplies against Rommel's arrival in southern Tunisia. Seven missions were run against them late in December, the results showing the high degree of accuracy the B-17's were achieving. P-40's of the 33d Group, by then operating out of Thelepte in central Tunisia, took the 301st to Sfax on 26 December; the bombs evidently wrought havoc in the harbor, one small and two large vessels being assessed as sunk. Next day the 301st attacked Sousse, claiming hits on four ships, one of which was reportedly blown to bits. Sfax absorbed further punishment on the 30th and 31st: the 97th started fires in the marshalling yards and on the west end of its north quay on the 30th, and next day the 301st claimed hits on two medium-sized ships in the harbor.<sup>78</sup>

On 4 January weather prevented all but one of a formation of B-17's from bombing La Goulette, but on the 5th and the 8th effective strikes were carried out. The 5th saw the 97th Group over Sfax, weather reconnaissance having disclosed solid overcast at Tunis and Bizerte. Eleven B-17's bombed and completely destroyed the Sfax power station, hit at least one vessel in the harbor, and left the entire dock area smoking. Bad weather did not protect Ferryville on the 8th. The 97th found holes in the overcast, bombed through them, and reported hits on oil storage tanks, docks, and ships. After Tunis had fallen in May it was learned that the ships included five French vessels sunk or damaged beyond repair: a submarine, a sailing vessel, a tug, an aircraft tender, and a patrol vessel.<sup>79</sup>

During their early operations in Africa the Twelfth's medium bomb-



ers did not achieve the performance of its heavies. For this there were cogent reasons: the medium groups had no previous combat experience and their tactics and employment remained to be worked out; they arrived in the theater mostly in dribbles, and the 319th, for one, kept losing its commanding officers; once operational, they could not be kept at strength and suffered loss of morale and combat effectiveness.<sup>80</sup>

Medium bomber targets comprised, for the most part, airdromes, marshalling yards, and railroad bridges, although unsuccessful forays were made against shipping at sea and Sousse harbor was twice attacked. The outstanding lesson taught by these operations was that B-25's and B-26's could not be used profitably in low-level attacks on localities where the Germans had had time to get in any considerable amount of their light AA. The mediums were speedily driven to altitudes of 7,000 to 9,000 feet; and even there violent evasive action was necessary, with the result that their accuracy was not so great as that of heavies at 21,000 to 24,000 feet. All missions were on an extremely modest scale: for a time after 5 December the 310th's striking force consisted of a half-dozen B-25's, and the heaviest medium attack during 1942 mustered only thirteen bombers, the resources of both the 310th and 319th.<sup>81</sup>

The first attempt to bomb Sousse harbor was frustrated on 12 December when two B-26's were lost to the winter elements. Next day six B-25's, escorted by four P-38's, bombed from 7,000 feet plus and reportedly hit the docks and two ships in port. On the 14th, the Sousse anti-aircraft gunners were apparently befuddled when six of the 319th's B-26's swept in at 900 to 1,200 feet, hit the docks and, it was thought, three vessels in the harbor; bombers and escort got away unscathed. But when this tactic was repeated on the 15th and 18th it proved so dangerous that low-level bombing against land targets was virtually abandoned except where little or no AA was expected. Phillips was killed over El Aouina on the 15th in a flak barrage to which a cruiser and four destroyers off Carthage contributed. On the 18th, four P-38's from the 1st Group escorted five B-26's and six B-25's to the Sousse marshalling yards where they attacked at from 700 to 1,500 feet. They were greeted by a mile-long box barrage which shot down a pair of B-26's, one of which defiantly continued to fire at the flak barges until it crashed into the harbor.<sup>82</sup>

After the Sousse marshalling yards, the mediums were quiescent for more than ten days, the crews spending their time sweating out bad weather and practicing minimum-altitude bombing, soon to be effec-

tively employed against shipping in the Sicilian narrows. At the end of December, when operations were resumed, the effort was concentrated on airdromes—the mediums having largely taken over this function from the heavies—and on the Tunisian railroads which were carrying supplies not only for Rommel but for the growing Axis establishment in central and southern Tunisia.<sup>83</sup> On 30 December the 17th Group made its debut, six of its B-26's hitting the Gabès airfield. (The 17th had arrived in Africa via the southern route, Natal-Ascension-Bathurst.) On the 31st, when it returned to the Gabès field with a mixture of demolition bombs and the 100-pound frag clusters which subsequently proved their worth in the Tunisian air war, enemy fighters downed one B-26 which had first been hit by flak.<sup>84</sup>

On New Year's, while the 310th was moving to Berteaux, another of the new fields near Constantine, the 17th went to the heavily defended Tunis marshalling yards, where the intense flak shot down one B-26 and the escort lost a P-40 in an encounter with a half-dozen Me-109's. On 4 January the GAF discovered that unescorted B-26's were to be handled with care. The occasion was a coincidence: an Me-109-Ju-88 formation arrived to bomb Thelepte at the moment when eleven B-26's arrived over near-by Feriana to pick up escort from the field. The B-26's turned for home, were attacked by five Me-109's, and promptly shot down two. Meanwhile, the Ju-88's were, one by one, dive bombing across the field. Five P-40's got off, made interception, and shot down one of the offending Junkers and one of the remaining Me-109's.<sup>85</sup>

### *Logistics in Africa*

When, on 2 January, Eaker, who had just returned from Africa, informed Stratemeyer that the failure to "sweep the Axis out of Tunisia" was due, among other causes, to the breakdown of supply, his statement was profoundly representative of sentiment in Africa. In fact, the rate of Axis build-up as compared with what the Allies could get forward to Tunisia was at the time a matter of no little concern in Algiers.<sup>86</sup>

The Twelfth was especially bedeviled by the difficult logistics of Africa because the planners had not anticipated that in the early stages of the operation it would be a highly mobile air force, nor that it would be operating so far east. The Twelfth's chief bases in the final months of 1942 were Oran and Casablanca; units—in four or five echelons—

aircraft, and equipment all came into these areas, whereupon a large part had to move again to the active sectors in the east. Some of their equipment did not catch up with the tactical units until the Tunisian campaign was virtually over. Early in January when the Twelfth had begun sizable operations in eastern Algeria, AFHQ designated as its forward base the port of Philippeville, whence a railroad led south to Constantine and connected with the lines serving Telergma and Biskra and with the line running to the installations at Tebessa and Youks-les-Bains.<sup>87</sup> The daily capacity of the Biskra line was 400 tons, and the Twelfth's allotment of that tonnage (reportedly 250) was not enough, with its other requirements, to bring in its bombs and fuel.<sup>88</sup> On 4 January, Cannon reported to Doolittle that he had to reduce operations or his units would run out of 500-pounders altogether.<sup>89</sup> Here the C-47's were lifesavers. Frequently the B-17's took all Biskra's available bombs with them to Tunis or Bizerte, depending on the transports to replenish the stock before the next mission.

As serious as the *faiblesse* of the French African railways was the Twelfth's poverty in motor transportation. This shortage apparently derived from a number of causes: the current Air Corps system of assigning transportation did not provide as many vehicles as corresponding ground units possessed; many service units had been left behind because of the necessity of orienting the initial convoys for an immediate battle with the French.<sup>90</sup> According to a Services of Supply source, there came a time in the preparation of the Western Task Force when the planners discovered that the force was literally too large for its ships. The dilemma was referred to Clark, who decided to cut vehicular transportation, on the reasonable ground that the Western Task Force's role after French resistance had been quelled would not require as much mobility as that of the First Army.<sup>91</sup> (The historian of the 14th Group reported ruefully from Youks that RAF units had transportation adequate to move every man and piece of equipment in one trip, in contrast to the unhappy situation in which his organization found itself.) The lack of motor transportation was not peculiar to the Twelfth but extended throughout most of the Allied Force, and Doolittle complained that he had lost additional trucks and jeeps to the pools which were organized to equip the spearheads of the eastward drive. The situation was so bad that during the Casablanca conference a special convoy was laid on, which subsequently brought 5,000 trucks from the States.<sup>92</sup>

All of this enhanced the value of the three American troop carrier groups. Eaker reported on 2 January that out of the original 154 air transports, 135 were still in operating condition and that without them the problems of transport and supply in the theater would have been insoluble.<sup>93</sup> They had dropped paratroops, ferried airborne engineers, and stocked advance airfields before the fighters moved in. Reflecting the decline in paratroop operations, on 5 January the 51st Troop Carrier Wing was assigned to Dunton's service command. Taking the view that this relegated them to mere service organizations, the troop carrier units seem to have contested the assignment. Not until February did they cease dealing directly with Twelfth Air Force headquarters.<sup>94</sup>

All observers remarked on the poor communications in Africa, on the overcrowded telephone circuits, and the extensive use of motor-cycle couriers. In mid-December there was no D/F, radio range, or beacon equipment at either of the bomber stations, Telergma or Biskra, nor any radio equipment for controlling the traffic at Tafaraoui or Maison Blanche. This situation only improved slowly.<sup>95</sup>

Conditions at Thelepte, a base forty miles southeast of Tebessa which was occupied by XII Fighter Command early in December, must have been fairly typical. In the semidesert country of Tunisia, Thelepte was a good dry-weather field, commodious and less subject to miring than Youks back in the mountains. It had no radar and, properly speaking, no warning net; willing French gendarmes telephoned in when they saw aircraft but reported all aircraft as hostile. Day air-drome patrol was maintained, and although the field was frequently bombed, as were Youks and Biskra, the attackers, mostly Ju-88's, were not very numerous or successful.<sup>96</sup> The AA defense at Thelepte late in December consisted of four 40-mm. Bofors and four .50-cal. machine guns. At about the same time, Youks could count on eleven 40-mm. and four 90-mm., besides some .50-cal. positions,<sup>97</sup> an armament which was much better than that at Biskra, where at Christmas the only AA defense was that of the twelve .50-cal. guns furnished by the resident aviation engineers.<sup>98</sup>

At Thelepte the men lived largely in a ravine forty minutes' walk from the aircraft dispersal area. (At Youks they had gone underground in tarpaulin-covered dugouts.) Spare parts were quickly exhausted and thereafter came from wrecks; tin from flimsies became aluminum for patching holes; cannibalization and improvisation were the rule. All work went on in the teeth of a high, cold wind—the Biskra oasis with its

palm grove must have been one of the few combat bases that corresponded to the average GI's notion of Africa—with insufficient tools and equipment and in constant expectation of enemy air attack. Morale among ground personnel at these stations nevertheless remained high.<sup>99</sup>

According to its own estimates, the Twelfth Air Force consistently inflicted heavier losses than it suffered at enemy hands. In November it had lost only 19 aircraft to enemy air action, AA, and unknown causes but had shot down a total of 48 enemy planes. In December the Twelfth accounted for 61 hostiles as against its own loss of 49; the “box score” read 167 to 72 for January and 136 to 74 for February. A good many factors conspired to prevent the Twelfth from building this advantage into air superiority, but high among them was the continuing shortage of replacement aircraft and crews.<sup>100</sup>

The prelanding plans had contemplated that because of the difficulties of replacement the American air units in TORCH must initially live on their own, drawing replacement aircraft from first-line strength,<sup>101</sup> and Doolittle was quickly forced to this device to fill up his active P-38 squadrons. But when by 6 December no aircraft replacements had yet reached the Twelfth (except for the “advance attrition” of the 33d Group which had been catapulted from HMS *Archer* on the D plus 5 convoy), Doolittle pointed out to Arnold that the TORCH plans had *not* contemplated an early move to the east nor early contact with the GAF.<sup>102</sup> His problem was not alleviated by the fact that for a variety of reasons a good portion even of the Twelfth's first-line strength had not arrived. This factor was particularly serious, however, only in the case of the P-38's and medium bombers; it is probable that the Twelfth could not in any event have deployed its P-39 groups in view of the scarcity of forward airdromes.

In the latter part of October, because of the losses incurred on the North Atlantic ferry route by the 319th Group (B-26's) and the 47th Group (A-20's), it had been decided that the remaining medium and light bombers allocated for the Twelfth would be flown over the South Atlantic to central Africa and thence northward into the theater.<sup>103</sup> As the winter drew on, the northern route closed down altogether. By 11 December only four-engine bombers were using it; a week later they had to abandon the crossing.<sup>104</sup> This meant that all replacement aircraft for the Twelfth, except for fighters, would fly via central Africa. It also meant that the Twelfth was placed strategically athwart the Eighth's bomber pipe line: the first twenty-eight B-17 re-

placements coming over the southern route stayed in Africa on Spaatz' instructions.<sup>105</sup>

The original staging arrangements for the medium and light bombers (the question was more important for them than for the longer-range heavies) contemplated a South Atlantic crossing via Ascension to Accra on the Gold Coast; depending on the reaction of the Vichy-controlled areas of western Africa, they would then be flown from Kano, Accra, or Maiduguri to Oran and Casablanca once communications were established. Such was the plan advanced from Washington by the Air Transport Command (ATC) late in October.<sup>106</sup> Doolittle, concerned over the long distances involved in the final leg, had suggested that the overwater terminus be shifted to Bathurst in Gambia and that Atar in French Mauritania be considered as a way station on the hop to Casablanca. Use of Atar, of course, depended on a change of heart by the French command in western Africa.<sup>107</sup>

After D-day the Africa-Middle East Wing (AMEW) of the ATC established a C-87 shuttle from Accra to Oran via Kano, the first flight being made on 13 November; and the 68th Group's two A-20 squadrons had successfully negotiated this route before the end of the month.<sup>108</sup> However, when the 17th Group arrived at Accra on 26 November, Col. Curtis D. Sluman advised that his B-26's as then equipped and loaded lacked 100 miles of the range necessary for the 1,700-mile Kano-Oran leg. It was then necessary to reroute them to the westward.<sup>109</sup> After a two-week delay at Accra, Roberts Field in Liberia, and Bathurst, the group finally got off to Marrakech after Governor Pierre Boisson on 7 December had removed the long-time threat of Dakar by agreeing that all French West Africa and Togoland would thenceforth cooperate with the Allies.<sup>110</sup>

With Allied access to its airdromes Dakar became the logical terminus for the overwater hop of all aircraft bound for North Africa and England over the southern route. But, during the time it took to negotiate further with the French and to complete arrangements, Bathurst in neighboring Gambia was the most important ferrying station and headquarters of AMEW's 14th Transport Group.<sup>111</sup> The more easterly routes to Algeria and Morocco were gradually abandoned: the ATC gave up the uneconomical C-87 run from Accra to Oran; and the 320th and 321st Groups, following the 17th into Africa in December and February, respectively, proceeded via the west coast to Marrakech. At the latter point, early in January, Spaatz set up a control center where



aircraft bound for the United Kingdom and North Africa could be sorted out and briefed accordingly.<sup>112</sup>

Despite all efforts, the medium bomber replacement rate continued unsatisfactory into February and, with the concurrent shortage of replacement pilots and crews, caused a serious lowering of morale in the operating groups; during that month it became necessary to retire the 319th Group for rest and refitting. The Twelfth could not maintain the policy of the "full breakfast table" so important to morale and effective operations. Instead it was forced to the uneconomical policy of relieving entire squadrons and groups, often in the stress of battle when transportation facilities were heavily burdened.<sup>113</sup> This unfortunate situation existed in an acute form in the fighter groups.

Because of considerations of weather and their shorter range, fighter aircraft replacements in the winter of 1942-43 had to make the journey into the theater by boat, thus running into the shortage of shipping and the competition of other cargo. Of course, most of the aircraft set up for the early phases of TORCH had been prepared by Eighth Air Force depots and flown into Africa; and during December small shipments of fighters for the Twelfth were routed to the United Kingdom simply because cargo space to Africa was at a premium.<sup>114</sup> By the New Year, this practice had ceased and, except for the large backlog of aircraft the Eighth was still preparing for TORCH, the Twelfth imposed no further burdens on VIII AFSC. It began to rely on its own depots and erection facilities, particularly Cazes where assembly lines—one manned by French civilians—had been put into operation.<sup>115</sup>

The fighter replacement problem first became critical with the P-38's, which because of their versatility and endurance were used in a variety of roles during the early Tunisian fighting. (In November 1942 no other available Allied fighter, RAF or USAAF, had the tactical radius to operate from Youks against the front at Djedeida.) Doolittle had been forced to take planes from the 1st Group to keep the 14th at strength and use the 82d to make up attrition in the 1st and 14th.<sup>116</sup> Nevertheless, at times the bomber command could not find a dozen P-38's for escort, and Cannon's pleas for fighters became progressively more desperate during January.<sup>117</sup>

The total strength of the three P-38 groups (minus one squadron) was down to ninety when Arnold came to the Casablanca conference. He initiated drastic action,<sup>118</sup> ordering all P-38's in from England. The Twelfth had already scoured the United Kingdom for P-38's, and this

order brought down the last of the Eighth's P-38 units, the 78th Group, which had been held in "strategic reserve" for Doolittle.<sup>119</sup> Eisenhower having assigned the necessary priority, Arnold sent instructions that additional P-38's were to be sent from the United States as deck loads on cargo vessels—a novel method of carrying them on specially constructed stands on tanker decks had also been devised<sup>120</sup>—and still others were to be flown over the South Atlantic via Ascension.

By the time of the conference, a shortage had also developed in P-40's. The 33d Group had brought with it two months' replacements (Spaatz recommended that all groups committed to an operation such as TORCH carry along at least the first month's replacements),<sup>121</sup> but it had donated twenty-five planes to re-equip a French squadron, the Lafayette Escadrille,<sup>122</sup> and its losses at Thelepte began to be heavy. Here the *Ranger* proved invaluable. Admiral King made the carrier available as a result of a plea from Eisenhower to the War Department in December: it ferried the air echelon of the 325th Group—seventy-five P-40's and pilots diverted from the Ninth Air Force—in mid-January, the planes landing at Cazes,<sup>123</sup> at the Casablanca conference Arnold asked for its continued good offices, and it brought seventy-five P-40L replacements in February.<sup>124</sup> However, out at Thelepte, the 33d Group, short of new pilots and down to thirteen aircraft by the 1st of February, had to be relieved in the midst of intensive operations.<sup>125</sup>

On 2 February, Spaatz reviewed the Twelfth's aircraft status for AAF Headquarters and indulged in some general remarks on aircraft serviceability in Africa.<sup>126</sup> He reported that so far as the number of aircraft was concerned his heavy bomber situation was for the moment excellent, permitting all replacement B-17's in Africa to be dispatched to the United Kingdom, and that the low number of heavy bombers in operation traced to motor changes due to sand. He pointed out that in a theater like Africa in ordinary course no more than 50 per cent of over-all aircraft strength would be serviceable for operations and that, therefore, to keep at strength an active combat unit, strength at least 50 per cent above T/O must be available. On the 20th he was complaining of a "critical" situation in his medium and light units and had warned the 2d Air Defense Wing at La Senia that the 319th Group would be retiring to Oujda, turning over enough of its B-26's to the 17th to bring the latter to strength.<sup>127</sup> Not until 26 March could he write home of a "very, very noticeable improvement" in replacement aircraft.<sup>128</sup>

## CHAPTER 5

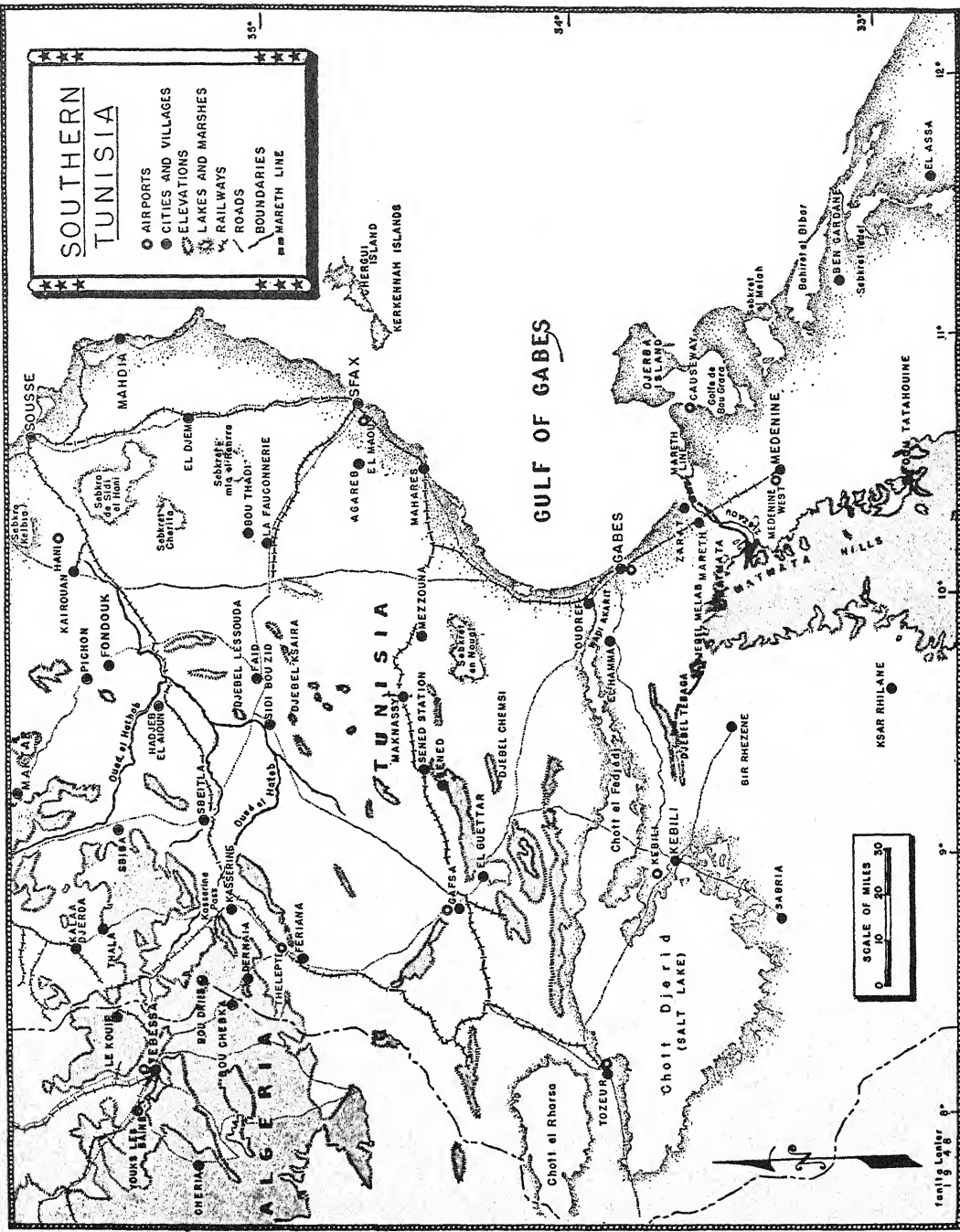
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### *DEFEAT AND REORGANIZATION*

**D**OMINATING the military geography of central Tunisia, the chief arena of the contending armies in early 1943, is the Grand Dorsal system which begins by furnishing the southern rim of the Tunis plain and extends clear to the Chotts, the large salt lakes west of Gabès. In the vicinity of Djebel Fkirine, two ranges of the Grand Dorsal become apparent, with the valleys between running in a generally southwest to northeast direction. The Eastern Dorsal stretches southward to the Chotts with passes at Fondouk, Faid, Maknassy, and Gafsa, in that order. The Western Dorsal parallels it but bends rather farther to the west as it approaches the Chotts. In the passes and the empty valleys between these rugged systems, the battles of central Tunisia were fought.<sup>1</sup>

The Twelfth Air Force had first penetrated this general area on 15 November when Raff's paratroops had jumped at Youks-les-Bains, in the highlands of eastern Algeria.<sup>2</sup> A little more than a week later, Youks was harboring DB-7's and P-38's, which saw much service during the first battle for Tunis.<sup>3</sup> Raff and his French allies having pushed patrols far to the east, by the first week in December, XII Fighter Command was able to occupy one of the most valuable airfields in the whole battle zone—Thelepte, in the flatland between the mountainous interior and the Western Dorsal.<sup>4</sup> Thelepte was dry, large, and adjacent to other suitable airfield sites. Commanding the "installations" at Youks and Thelepte was Col. Thomas W. Blackburn, commander of XII Fighter Command, who received a star on 11 December.<sup>5</sup>

Blackburn began with two, later increased to three,<sup>6</sup> P-38 squadrons and the 15th Bombardment Squadron (L), all working from Youks. Although he was responsible for the protection of the Franco-American force in his immediate vicinity, his activities were subordi-



SOUTHERN  
TUNISIA

AIRPORTS

CITIES AND VILLAGES

ELEVATIONS

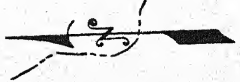
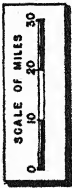
LAKES AND MARSHES

RAILWAYS

ROADS

BOUNDARIES

MARETH LINE



nated to the requirements of the northern sector while any hope remained that Tunis could be taken in December.<sup>7</sup> Consequently, his aircraft habitually went into a region where the GAF held air superiority; the fighters inevitably took some losses protecting their charges, but their pilots discovered with satisfaction that the P-38 stacked up well with the current Me-109 and FW-190, being able under certain conditions to outrun and outturn both types.<sup>8</sup> The DB-7 outfit, having had some operations with the Eighth Air Force, could be classed as experienced; actually it seems to have done well at Youks, employing the level-bombing technique from 8,000 to 11,000 feet to which it had been used in England, and even reporting a high state of maintenance.<sup>9</sup>

Eventually, the P-38 and DB-7 units were relieved, the former going back to the bomber stations for escort work and the 15th's pilots back to the States.<sup>10</sup> General Blackburn received in their stead the 47th Bombardment Group (L) and the 33d Fighter Group, both up from Morocco. The 47th, commanded by Lt. Col. F. R. Terrell, had a detachment at Youks by 13 December, and twenty additional A-20B's came into Thelepte on the 28th. It happened that the 47th had been trained in America in low-level support, a mode of warfare rendered expensive in Africa by the excellent German light flak. As a result, retraining had to be undertaken in the midst of active service; bombsights (British Mark IX-E) were installed and student bombardiers were recruited within the group. In the end, after the Kasserine battle, the 47th was withdrawn to Canrobert for retraining as well as refitting.<sup>11</sup> Momyer's 33d Group (P-40's), by its own admission, also learned a great deal out at Thelepte, its preceptors two squadrons of Me-109G's at Gabès.<sup>12</sup>

From 14 to 30 December about half of the targets attacked by Blackburn's planes faced British or French units in the northern sector: Pont-du-Fahs, Mateur, Massicault, Sidi Tabet; but after the latter date no missions went north of Pont-du-Fahs. The DB-7's and A-20's hit at docks twice, at shipping twice, at airfields on four occasions, and railroad targets on nine.<sup>13</sup> Particularly fortunate results attended the maiden mission of the 47th.<sup>14</sup> Blackburn's activities also included reconnaissance in the Medenine-Tripoli area where his P-38's could keep an eye on Rommel's disposition and supply and often find profitable targets of opportunity. With the onset of January, XII Fighter Command began to take on new targets: armor and troop concentrations. On the 3d, reconnoitering P-40's reported approximately fifty enemy tanks

moving westward towards the French positions at Fondouk. All the fighter command's efforts were directed against this excursion, but the Panzers proved both formidable and elusive, quick to turn effective fire on low-flying aircraft, burrowing into bushes, and camouflaging themselves when caught in the open.<sup>15</sup>

The increasing number of Germans in central Tunisia was a reliable indication that large enterprises were in store for the area. As part of the American preparations, XII Fighter Command was relieved and XII Air Support Command, which had at last got quit of Morocco, was substituted, Brig. Gen. Howard A. Craig taking command on 10 January.<sup>16</sup> What was afoot on the Allied side was Operation SATIN, a project in which II Corps was scheduled for a prominent role.

SATIN took its inception around Christmas from Eisenhower's reluctant conclusion that an assault on the drenched northern front was not a practicable operation of war and from his unwillingness to allow the opposition any rest. Clark's headquarters commenced the planning in December and II Corps staff assembled in Algiers on New Year's Day to begin preparations. At least three alternative plans were drawn, all requiring the SATIN Task Force, of which the U.S. 1st Armored Division was the core, to be concentrated forward of Tebessa. Sfax might be taken, followed by a swing northwards towards Sousse; or Gabès and Sfax captured in that order; or Kairouan could be taken as preliminary to an advance on Sousse. Basically, SATIN was a large-scale raid on Rommel's communications, for the bulk of his supplies were coming down to Sfax by rail from Tunis and Bizerte. It was not anticipated that the coastal towns would necessarily be held.<sup>17</sup>

The project had its risks. In the first instance, success depended on a coordinated attack by the Eighth Army on the Mareth Line, the old French works in which Rommel was expected to make his stand. Failing such a conjuncture, Rommel could easily detach enough strength to jeopardize SATIN's southern flank and its communications with Algeria. SATIN's other flank was similarly vulnerable to a known concentration of enemy armor around Kairouan. Reluctantly, Eisenhower accepted the fact that Anderson's British First Army would have to be simultaneously expended in local containing attacks in the north; he was trying to build up Anderson for decisive action in the spring. Once east of the Tebessa railheads, all SATIN supplies would have to proceed in trucks 160 miles to the sea. Trucks were scarce, but it was



hoped that by dint of Middle East convoys maintenance could be considerably eased.<sup>18</sup>

Another complication was the French sector. Early in December, Giraud had suggested to AFHQ that his units take over the defense of the Eastern Dorsal, a step which recommended itself on several counts. The scant Anglo-American forces needed help; political and morale problems might thereby be eased; and the mountains seemed a relatively good location for the ill-equipped French. But, by the time that SATIN was ready to take the field, the French sector had assumed crucial importance as the only link between II Corps and the First Army. Not only was the link weak but Barré and Juin refused to be subordinated to Anderson, who alone had the signal communications to control the entire front. Eisenhower had to take personal command, shuttling between Algiers and a command post at Constantine.<sup>19</sup>

If these factors had given Eisenhower pause about SATIN, what he learned on 15 January from Alexander at Casablanca about the Eighth Army's schedule caused him definitely to abandon the original conception. Rommel was nearing Tunisia at a fast clip, but the Eighth Army did not expect to reach Tripoli before late January or to be in a position to attack the Mareth Line before the middle of February. A coordinated attack on the SATIN D-day, 23 January, was impossible, and Rommel would have the elbow room to drive against SATIN's flank. On his return from the Anfa camp, Eisenhower informed Fredendall, whom he had appointed task force commander on 1 January after deciding that he needed Clark to head the Fifth Army, that there would be no excursions to the coast. He did not, however, propose to adopt a purely defensive attitude in central Tunisia and instructed II Corps to act as aggressively as possible against the Axis communications without committing its main forces. On 17 January he radioed the commanders in chief, Middle East, that they could cancel their arrangements for convoys to Sfax or Gabès.<sup>20</sup>

### *Air-Ground Cooperation in Central Tunisia*

In the orders for air support which went forward on 1 January, Welsh was to provide assistance from 242 Group, insofar as it was not committed at the time to the First Army, but the main burden lay with XII Air Support Command. XII ASC became responsible not only for cooperation with II Corps but for meeting requests for aid from French elements south of an east-west line through Dechret bou Dabouss (on

the approximate latitude of Sousse), these requests to be passed through Fredendall. Moreover, XII ASC was empowered to arrange mutual assistance with 242 Group to the north.<sup>21</sup>

The doctrines of air support current in the U. S. Army in January 1943 stemmed from War Department Field Manual 31-35 of 9 April 1942, *Aviation in Support of Ground Forces*, and little resembled the doctrines employed in later European campaigns, for the reason that FM 31-35 was tried in Africa, found wanting, and superseded. The outstanding characteristic of the manual lay in its subordination of the air force to ground force needs and to the purely local situation. By its prescription, the air support commander functioned under the army commander, and aircraft might be specifically allocated to the support of subordinate ground units. Although conceding that attacks on the hostile air force might be necessary (when other air forces were inadequate or unavailable) and that local air superiority was to be desired, the manual recited that "the most important target at a particular time will usually be that target which constitutes the most serious threat to the operations of the supported ground force. The final decision as to priority of targets rests with the commander of the supported unit." With him also lay the decision as to whether a particular air support mission would be ordered. Both as to command and employment of air power (which were nearly inseparable) the American doctrines were at variance with those developed and so successfully tested in battle by the Eighth Army-RAF, ME partnership in the Western Desert.

Nor had the scrutiny of the combined staff that planned TORCH made any great impression on the received doctrine. The spirit of FM 31-35 was echoed by AFHQ's Operation Memorandum 17 of 13 October 1942,<sup>22</sup> which theoretically prescribed the air support arrangements for the Allied Force. Although not a great improvement, this document did stress that air support was an important means of preventing the arrival of hostile reserves and reinforcements; and it contained the monitory statement that support aircraft should not be "frittered away" on unimportant targets but "reserved for concentration in overwhelming attack upon important objectives."

In appointing Craig to head XII ASC, the higher command had hit on one of the few officers in the Allied Force who was at all familiar with Western Desert practice. Craig had accompanied Tedder on his return to the Middle East on 17 December. In Cairo he had visited the com-

bined war room, and when it turned out that his plane needed an engine change before he could return, he utilized the interval, at Tedder's suggestion, for a trip to the army-air headquarters near Marble Arch in Tripolitania. Coningham met him at the airfield and flew him in a captured Storch to the RAF command post, where he had dinner with Montgomery and absorbed a good deal of the current thinking on army-air operations.<sup>23</sup>

On 9 January, Craig's air establishment consisted of two understrength squadrons of the 33d Fighter Group and the entire 47th Bombardment Group; the P-38's of the 14th Group were then in process of being withdrawn. The airdrome situation had been somewhat improved. Besides Youks, inclined to mud, there were Thelepte, forward landing grounds at Gafsa and Sbeitla, and construction under way or contemplated at Tebessa, Le Kouif, and Kalaa Djerda. In addition, if SATIN had broken through to the coast, according to the original intention, XII ASC could have counted on airfields at Gabès and Sfax and numerous good landing-strip sites in the coastal plain.

Craig could not overlook the deficiencies of his command. He called attention to the low serviceability of the 33d Group and the "ineffectiveness" of the 47th, which, considered poorly trained in all respects, he recommended be withdrawn. He sought clarification of the status of the Lafayette Escadrille, scheduled shortly to arrive in his area, as the impression prevailed at Tebessa that the French army would control this unit. On 11 January, after a conference at corps headquarters at Constantine, Craig came to the conclusion that he had not enough air power to perform his mission; considering the ambitious nature of the current SATIN design, he was entirely right. Doolittle radioed back that reinforcements were indeed contemplated, and he concurred in XII ASC's plan to conserve its operational strength for the forthcoming test.<sup>24</sup>

Perhaps reflecting this conservation policy, XII ASC was relatively inactive, except for normal reconnaissance and repelling constant raids on its fields, in the period from 8 to 18 January. II Corps was still in preparation, and the Germans and Italians made no immediate move. Craig began receiving the promised reinforcements: the 91st and 92d Squadrons of the 81st (P-39's) and the Lafayette Escadrille (P-40's). He landed the P-39's on a level stretch of road and parked them in bushes to conceal them from the active GAF. The chief operation of note took place on the 10th. The enterprising Maj. Philip Cochran,

then commanding the 33d Group's 58th Squadron, dropped a 500-pounder squarely on the Hotel Splendida, German headquarters at Kairouan, demolishing the building; and on the same day the A-20's went down to Kebili, beyond the Chott Djerid, for a low-level attack on a military camp.<sup>25</sup>

On the evening of 17 January, II Corps began moving up from the Constantine-Guelma area; already battalions of American infantry were at Kasserine and Gafsa. Facing II Corps in the sector from Fondouk to Maknassy was the equivalent of one strong division of mixed German and Italian infantry and an armored force possessing about 100 to 115 light and medium tanks, exclusive of the 10th Panzer Division north of Kairouan. On 18 January the Germans struck with *Unternehmen Eilbote* (Operation COURIER).<sup>26</sup>

The blow fell, characteristically, at the junction of the French and British sectors in the Bou Arada-Pont-du-Fahs area, the main attack threatening to flow down the Robaa valley and cut off the French positions in the mountains to the east. As the French drew back, the British and Americans began to come to their aid, with detachments of the British 6 Armoured Division and Combat Command B of the U.S. 1st Armored. Moreover, an American reserve force was directed to Mak-tar. By the 19th the British had begun to exert pressure on the enemy flank at Bou Arada. Nevertheless, the Germans were able to penetrate far down the valley and join two separate columns at Robaa village.

On 20 January another attack developed. The Germans stormed Djebel Chirich, controlling the entrance to the Ousseltia valley, east of and paralleling the Robaa valley, and once again drove down the valley floor, isolating the French in the Eastern Dorsal. During the night enemy detachments reached Ousseltia village. By the 22d the situation had somewhat improved, with the 6 Armoured establishing itself on the Robaa-Pont-du-Fahs road and Combat Command B moving up the Ousseltia valley itself. Next day under cover of Combat Command B the French were able to extricate themselves from the Eastern Dorsal north of the Ousseltia-Kairouan road. By 25 January the enemy attack was spent.<sup>27</sup>

The Axis assault on the French exposed at least one weakness of the air support doctrines then in use along the Tunisian front. During the first three days of the Robaa-Ousseltia action, XII ASC did not fly any missions in the area nor were its aircraft especially active on its own front. The fighting lay north of the Dechret bou Dabouss line beyond

which the RAF had been originally responsible, and 242 Group had obliged by laying on Hurribomber sorties against such targets as the Germans and Italians presented. However, II Corps, which controlled XII ASC, at one point refused a French request for air reconnaissance on the grounds that it had no responsibilities or interest in the area. It was true that about seventy miles of rugged terrain separated the ground organizations, but such a distance was of course no barrier to General Craig's aircraft.<sup>28</sup>

On 22 January, Spaatz dispatched Tedder a message describing the air support situation as critical. He informed the air marshal that he was forced immediately to implement part of the Casablanca-approved organization. Kuter, who had been transferred from England to become A-3, Allied Air Force, was to be assigned as acting commander of a coordinating air support organization until Air Marshal Coningham could arrive. Coningham's early arrival was of the utmost importance, said Spaatz. Kuter would control the twin organizations XII ASC and 242 Group and cooperate with General Anderson, who in the emergency had been given power to coordinate II Corps and the French sector. Also, on 21 January, Col. Paul L. Williams succeeded Craig, who had come down with pneumonia, as commander of XII ASC.<sup>29</sup>

Spaatz had Kuter's directive ready on the 22d, and by the next day the new commander had a cable address and a chief of staff, Col. John De F. Barker, at First Army headquarters in Constantine. His organization was known as the Allied Air Support Command and was the lineal ancestor of the Northwest African Tactical Air Force. By 25 January, Kuter and AASC were in operation, passing bombing requests back to Twelfth Air Force and Eastern Air Command.<sup>30</sup>

After 25 January the Allies were able to stabilize the situation in the Ousseltia valley, with Combat Command B, under Brig. Gen. P. L. Robinett, patrolling north from Ousseltia. Next day the 26th RCT attacked Kairouan Pass in the Ousseltia valley and took 400 Italian prisoners. The Germans retired up the valley, strewed it with mines, and went on the defensive in the high ground at its northern end. Until rain curtailed activity after the 24th, XII ASC gave more substantial aid than in the early days of the operation. On the 22d, ten P-39's of the 81st Group, together with sixteen P-40's from the 33d and the Lafayette Escadrille, swept the battle area, strafing tanks, trucks, and machine-gun positions, losing one P-40 in the process; that afternoon the A-20's bombed a tank depot seventeen miles NNE of Ousseltia.

Next day an attack coordinated with the ground forces was laid on against two infantry companies and heavy batteries. Half a dozen A-20's dropped a mixture of 100-, 300-, and 500-pound GP's and 8 x 120-pound frag clusters from 3,000 feet. Prisoners stated that two ammunition dumps were destroyed.<sup>31</sup>

By 26 January the operational strength of XII ASC had been built to fifty-two P-40's, twenty-three P-39's, twenty-seven A-20's, and eight DB-7's.<sup>32</sup> But most of the units in this considerable force labored under handicaps of one sort or another. The 47th Group's training has already been mentioned. The Lafayette Escadrille had been re-equipped by the Americans largely as a political gesture. With pitifully inadequate experience in P-40's, and without equipment or ground echelon, it was sent up to Thelepte.<sup>33</sup> The 81st also had its difficulties. On the group's flight down from England, its commander had been interned in Portugal. At Thelepte, at first no one knew how to use the P-39; its performance showed it to be no fighter aircraft. Eventually, its specialty became "rhubarbs"—strafing or reconnaissance missions carried out at minimum altitude with P-40's or Spitfires covering. Although the plane was remarkably resistant to flak, P-39 pilots soon gave up the practice of making more than one run on a target or attacking where AA installations were known to be present.<sup>34</sup>

The Ousseltia thrust had been checked, but it had once more demonstrated the inability of the French army to withstand modern armored onslaught. That Von Arnim would launch further attacks to gain protective depth for his communications with Rommel, and that the blows would fall on the French XIX Corps between Pichon and Faid, were appreciated as virtual certainties at AFHQ; the Allies envisioned falling back as far as Sbeitla and Feriana. As precautionary measures, Anderson was directed to concentrate a mobile reserve south of the First Army sector, some French units were relieved, and fresh U.S. and British troops were hurried forward as best the transportation bottleneck allowed.

XII ASC continued to assault the enemy whenever opportunity offered. On 27 January half a dozen A-20's with P-40 escort raided the road-junction town of Mezzouna, east of Maknassy, and next day when the ground forces reported the location of hostiles in the Ousseltia valley, twelve P-40's obliged with a strafing attack. Gafsa was now being used as an advanced landing ground, and on the 28th a trio of Me-109's destroyed three A-20's which had landed there to refuel.



On the 29th two missions of a dozen escorted A-20's searched in vain for fugitive enemy truck concentrations.<sup>35</sup>

With the waning of the Ousseltia action, II Corps regrouped. Combat Command B was withdrawn behind Feriana to Bou Chebka, and Combat Command C—one battalion of medium tanks, one battalion of infantry, and one battalion of field artillery—moved south to reinforce Gafsa. At Sbeitla lay Combat Command A, of equal strength, and the 26th RCT.

On 30 January the Germans moved again, attacking the French at Faïd Pass. Employing sixty to seventy tanks, the push captured Faïd by 1900 hours, but the French fell back and maintained themselves at Sidi bou Zid, a few miles to the west. Combat Command A and the 26th RCT immediately moved east from Sbeitla, and other elements of the 1st Armored were ordered to attack Maknassy from Gafsa to relieve the pressure on Faïd. Reacting vigorously to the German drive, all day long Williams' aircraft bombed and strafed around Faïd. At 1015 hours eleven P-40's, six P-39's, and six A-20's were off against tanks in the pass; they claimed to have left twelve burning. The P-39's strafed and burned a half-dozen trucks, and all aircraft returned safely. Around noon, sixty more 100-pounders were dropped on a vehicle concentration, but one of the strafing P-39's was shot down and the pilot killed.<sup>36</sup>

On the 31st, Combat Command A attacked the enemy positions at Faïd, but the Germans, having brought in artillery which outranged the American guns, withstood all attacks that day and succeeding ones. A good part of Colonel Williams' effort on the 31st was absorbed in defensive patrols over the ground forces at Faïd and over Combat Command D attacking towards Maknassy, where eight of the 33d Group's P-40's engaged four to seven Me-109's, losing two to the enemy's one. However the 33d, abetted by the 81st Group, took the A-20's on two offensive missions back of the enemy lines, to Bou Thadi, northwest of Sfax, and to the railroad east of Maknassy.

On the 1st of February, Combat Command D captured Sened Station. On the day before, the unit had taken a severe cuffing from the Stukas, in one instance unwisely bringing troops up to a detrucking point in vehicles ranged almost nose to tail. According to Kuter, who spent some time studying the subject, this attack represented the only occasion when the Stukas wrought any great casualties on American troops. But ever since the Anglo-American repulse at Tebourba in November, the ground commanders had harped on the necessity for

aerial umbrellas. As Eisenhower pointed out in a report home, the troops were inexperienced and inadequately supplied with light flak, and the Stuka was a terrifying if not terribly effective weapon.<sup>37</sup> Consequently, on 1 February, XII ASC ran five cover missions over the Sened area, the earliest of which caught two dozen Ju-87's coming in with an Me-109 escort. The P-40's broke up the attack, shot down three Stukas with two probables and five damaged; two P-40's were shot down and a third listed as missing. The A-20's were also active that morning against a tank and vehicle concentration near Faïd.<sup>38</sup>

XII ASC, as an analysis of the types of its missions showed,<sup>39</sup> was still fighting according to the book, the book being FM 31-35. Having no offensive radar coverage, it was severely taxed to provide umbrellas and at the same time escort the A-20's and P-39's. (One P-39 squadron of the 68th Observation Group had arrived at Thelepte late in January, which added to the escort problem.) On 2 February the command suffered serious losses attempting to protect the wide front. The first cover mission, six P-40's and four P-39's, encountered twenty to thirty Stukas and eight to ten Me-109's over Sened Station. Although one Ju-87 was destroyed, five P-40's were lost. A reconnaissance mission of six P-40's and four P-39's which went out to the Kairouan area fared little better. Two more P-40's on A-20 escort duty were lost fighting off Me-109's. The 33d Group, Williams' most experienced and effective fighter unit, had finally either to receive replacements or be relieved. P-40F's, thanks to the *Ranger*, were available from the 325th Group, but replacement pilots were not available from any source. Consequently, it was necessary to bring in an entirely new organization. The 31st Group (Spitfires) began arriving at Thelepte on 6 February; earlier, two squadrons of the 52d had also been attached to XII ASC. The survivors of the 33d went back to Morocco for a rest and to pass on their experience to the 325th.<sup>40</sup>

Because of the failure to eject the Germans from the key position at Faïd Pass, Combat Command D was ordered to withdraw from Sened Station; by 4 February there remained in the southern area only one battalion of infantry, at Gafsa. Combat Command B, meanwhile, had been moved to Hadjeb-el-Aïoun and thence to Maktar under the mistaken impression that the enemy intended to thrust from Fondouk and Pichon into the Ousseltia valley. Defensive positions were also taken up before Faïd.<sup>41</sup>

Part of XII ASC's hard going was undoubtedly traceable to the fact

that the German squadrons operating against it had been strengthened by the remains of the Desert Luftwaffe and IAF, which had come in from Libya. The Eighth Army had captured Tripoli on 23 January. By the end of the month its patrols were over the Tunisian border. XII Bomber Command had struck at Rommel's air at the Medenine landing grounds on 24 January; and early in February, by request of Allied Air Support Command, it attempted by counter-air force action to relieve the pressure on XII ASC.<sup>42</sup>

The mediums proceeded to give the coastal airdromes the frag-cluster treatment. Ten parked aircraft were assessed as destroyed at Gabès on 31 January and three more at Sfax on 2 February. Two P-38's and a B-25 were lost on these strikes. On 3 February, ten more parked aircraft had to be written off at Gabès; the enemy fighters, coming up for a 40-minute battle, caused the crashes of one B-26 and three P-38's but reportedly lost three themselves. The afternoon of 4 February was a busy time at the fields around Gabès. The B-17's—97th and 301st Groups—the B-25's of the 310th, and the B-26's of the 17th all obliged with a visit, but only the heavies bombed, the others being prevented by bad weather.<sup>43</sup> Four days later, another strike at Gabès brought the opposition up in force. Fourteen P-38's of the 82d Group escorted in fifteen B-26's and eighteen B-25's. The B-25's took a severe mauling from interceptors which began attacking before the target was reached and persevered as far back as the Algerian border. The B-25 gunners reportedly shot down four Me-109's, but four bombers were also shot down and two crash-landed at base. The escort meanwhile was performing earnestly, claiming eight enemy fighters for one P-38, and the B-26's were having an argument of their own with twenty to thirty fighters which attacked just after the bomb run and likewise tried conclusions all the way to the Algerian border. The B-26's claimed six of them.<sup>44</sup>

After Combat Command A's repulse at Faïd, uneasy quiet reigned for a time along II Corps' front and the French sector to the north. German tanks and M/T began appearing on the Gabès-Gafsa road and around Maknassy. With Rommel snug for the time in the Mareth Line, it was accepted that the Axis was about to make a last effort to disrupt the Allied timetable, the locale of the stroke anywhere from Pont-du-Fahs to Gafsa.<sup>45</sup> Meanwhile, the Allied Air Support Command was developing in consonance with the command arrangements agreed on at Casablanca. On 7 February, Kuter wired Spaatz that he was exercising oper-

ational, but not administrative, control of 242 Group and XII ASC. Within a week the headquarters of the 18th Army Group, from which Alexander would supervise the Tunisian battle, was to be set up at Constantine, and headquarters of the First Army would be going forward. Kutler thereupon decided to send the greater part of his staff with the First Army, but himself to remain with 18th Army Group so that the air forces might be represented at that headquarters from the start.<sup>46</sup>

### *The War against the Enemy's Supply*

Despite the many disappointments that the Allies had suffered in North Africa—the bitter repulse at Djedeida which condemned the armies to the cold and mud of a Tunisian winter, the enemy's spoiling attacks in the Robaa-Ousseltia sector and at Faid Pass which had parceled out II Corps to the defense of the Eastern Dorsal—Allied councils entertained no doubts that in good time their armies would liquidate the Axis bridgehead. At Casablanca, Sir Alan Brooke had even set 30 April as the probable date. Given Axis commitments elsewhere, the dominant element in this confidence was the disadvantageous Axis supply situation.<sup>47</sup>

On the Allied side the convoys, stalked by submarines, came initially to Casablanca, Oran, and Algiers. Anything bound east of Oran had to be fought through as "Bomb Alley" came into operation. The most hazardous stretch of coast was between Algiers and Bône; unescorted LSI's shuttled back and forth and the convoys went up in two-week cycles. Bône itself was the Luftwaffe's favorite target: two thousand bombs of various potencies were dropped on it from 13 December to 1 February, but despite this hammering, 127,600 deadweight tons of cargo were discharged. Particularly heavy raids occurred early in January, the situation being improved only by laying hands on all available French AA and by the importation of night fighters from England.<sup>48</sup>

By strictly geographical comparison the enemy supply line was far superior. Covered by the Luftwaffe and the IAF, it led from Naples to Sicily's north coast (in deference to Malta) and from Trapani and Palermo across the narrow straits to Tunisia—contrary to a widespread impression, 90 per cent of the Axis flow of men and materials was sea-borne, only 10 per cent airborne. The Royal Navy maintained in the Mediterranean Force H, battleships and a carrier, which, in hopes that the Italian fleet would come out, indulged in sweeps from Gibraltar towards the Balearics and in an occasional visit to Algiers; and, more

particularly, at Bône the aggressive Force Q, cruisers and destroyers, searching by night the Strait of Sicily. Force Q, abetted by day and night bomber strikes on the ports and by air and submarine action in the strait, had already been able to inflict considerable damage. As additional Allied air power was emplaced in Africa and Malta, it was certain that the weight of these attacks would increase. If the Luftwaffe and the IAF suffered serious interim attrition, Tunisia might be altogether cut off.<sup>49</sup>

Whatever the future prospects, during November and December the Axis short line to Tunisia ran at fairly high efficiency, although ships on the Libya run were being butchered. After the first impact of TORCH the enemy passed his ships across regardless of risk; indeed he did not for the moment suffer greatly, for although British submarines had been concentrated at once on the Sicilian strait and Malta-based Albacores prowled the area by night, their efforts were mostly frustrated by weather. After the Allies were a little better established in Africa, the hunting improved; the Albacores began taking toll, and on the early morning of 2 December, Force Q found a convoy from Palermo. The cruisers *Aurora*, *Argonaut*, and *Sirius*, with two destroyers, sank or fired four enemy supply ships and three enemy destroyers.<sup>50</sup>

The Germans and Italians thereupon gave up the night crossing. They laid mine fields and crossed by day. The channel thus canalized was assailed by British submarines, which did good work but soon found the going too hard. To relieve the submarines of the closest inshore work, British minelayers laid fields near the Cani Islands; but after drawing blood, these were soon marked by the Axis. A decision was then taken to move the submarines north of Sicily and to mine extensively the waters which they were vacating. At this juncture, the Twelfth's medium bombers took a hand.<sup>51</sup>

For some time Doolittle had been desirous of employing the minimum-altitude technique worked out at Eglin Field, Florida, and tested and developed in the Aleutians and Southwest Pacific. In December, while the medium groups were training and modified N-6 gunsights and 4-second delay fuzes were becoming available, the P-38's did a little antishipping work off northern Tunisia, carrying one 1,000-pound bomb in place of a second belly tank. No success attended these ventures, nor the first three missions carried out by the mediums.

The B-17's, however, were leaving sunken hulks here and there in the harbors.

Early in January, AFHQ became seriously concerned over the efficiency of the Axis ferry from Sicily; and on the 6th, Cannon received a radio directing the immediate organization of a special striking force for use against shipping. The Twelfth's antishipping work, however, did not begin without some disputation. Cannon objected to a special force, asking instead that the countershipping function be assigned to XII Bomber Command. Doolittle, who at the time thought the RAF and USAAF should be kept separate as far as possible, objected to the EAC's claim to operational control of the force, despite the likelihood that EAC would be responsible for the reconnaissance which would provide the targets—Mosquitos were being requested for reconnaissance. Both officers evidently gained their points: all available mediums and P-38's took their turn at shipping strikes, and the Twelfth retained operational control. The Mosquitos failed to materialize.<sup>52</sup>

The program got under way with a very high priority around 11 January, the 310th Group (B-25's) flying most of the early sweeps, the 319th (B-26's) joining in on the 15th. As many as three separate missions were flown on a single day; typically they comprised a half-dozen B-25's or B-26's and a squadron of P-38's, at least that number of P-38's being needed for their own protection. The P-38's flew cover, spotting for the bombers below. The bombing was done at high speed from less than 200 feet, and the 500-pounders were directed in trains of three or six at the side of the vessel. Although convoy information was occasionally forthcoming from intelligence or overnight reconnaissance from Malta, most of the sweeps were made "blind." Reconnaissance planes were not safe over the channel in daylight, with an oversufficiency of enemy fighters on either side directed by efficient radar installations. Consequently, the missions were often fruitless.<sup>53</sup>

Commencing 19 January, the mediums began to find themselves after the overwater practice. First definite kill came on the 20th, when six B-25's escorted by twelve P-38's of the 14th Group sighted a small merchant vessel and a tanker, shepherded by two destroyers. Sustaining a direct hit, the tanker suffered a violent explosion, stopped, and settled (it was evidently the 5,000-ton *Saturno*, which the Italians lost that day). Next day the B-26's apparently drew blood. Fifteen miles west of Pantelleria, six of the 319th's bombers attacked two medium-



sized freighters, by their report sinking one and damaging the other. The P-38's had their hands full, as almost always was the case on these missions, the Sicilian strait being one of the world's busiest air lanes. They first encountered two Italian bombers, Cant.Z-1007's, which fired recognition signals red-red-red—and were shot down. Next, five to seven Me-109's joined from the clouds above. Two P-38's were lost, but three of the Me's were reported destroyed.

On 22 and 23 January the 319th repeated its success. On the 22d, five B-26's attacked a small convoy in mid-channel and scored two hits on a freighter before they were engaged by the convoy escort. Two B-26's crash-landed in the Bône area. Next day, four B-26's left a freighter listing in a cove near Hergla, above Sousse, and proceeding out to sea, claimed to have exploded a second freighter and capsized a third. A P-38 and a bomber were lost. In mid-channel on the 27th, the B-25's struck two destroyers whose decks were loaded with men. One DD was last seen flaming and listing heavily; the other likely sustained damage to its steering mechanism.

The antishipping sweeps went on day after day whenever weather permitted, and against them the enemy supply vessels began to gather in larger convoys with abundant surface and aerial escort. On the 27th four B-26's, whose P-38 escort had got separated in the clouds, prudently declined a large transport which was in company with no less than a cruiser, two destroyers, and three corvettes, while overhead ten to fifteen Me-109's and FW-190's flew guard. On the 29th, however, six of the 319th's B-26's, with a dozen of the 1st Group's P-38's overhead, performed brilliantly against a big convoy. Ignoring six freighters, they chose two cargo liners, fired one, and blew the superstructure off the other. Sixteen enemy aircraft offered battle but reportedly lost an Me-109, an Me-110, and an Me-210 to the B-26's. One bomber crashed into the sea just after the attack, whether shot down by the aerial escort or the accompanying destroyers and corvettes is unknown, but its mates went on to explode a small vessel farther west (probably the *Vercelli*, lost near this position) and strafe a trawler north of Bizerte.<sup>54</sup>

On 10 February, Admiral Cunningham cast up the progress of the war against the enemy's supply line. Admittedly the Twelfth's mediums had borne heavily upon the convoys, but had not achieved the hoped-for result of forcing them to resume the passage by night and thus present increased opportunities for Force Q. Instead the enemy

had heavily reinforced his air cover. Moreover, for lack of P-38's and good weather, the sweeps had lately been infrequent and ineffective, no positive results obtaining from 29 January to 9 February. No less a cause for worry at AFHQ was the change wrought in the Axis shipping situation by Rommel's retreat to Tunisia and by the occupation of Vichy France. At the end of 1942, the total shipping available to the Axis in the Mediterranean had been two-thirds reduced by sinking and damage. In September, Ciano had confided to his gloomy diary that the African problem would solve itself in six months for lack of ships. Tripoli coast waters provided the last resting place for most of the suitably sized tankers and the new fast vessels with the big derricks. Old and slow ships began to appear. With these resources, it had not been possible to provision Rommel to the point where he could make a stand against the Eighth Army in Libya.

In February 1943, the situation was different. The Axis ships need no more undertake the long and murderous voyage to Tripoli or Benghazi. Instead, they could shuttle across to Tunis and Bizerte with naval and air escort. Moreover, in the Marseille area the Germans had laid hands not on the French fleet, to be sure, but on about 450,000 tons of shipping, including nearly a dozen tankers. Although not all this shipping was suitable and the supply line's efficiency suffered from the aerial damage inflicted on ship repair facilities in Italian ports and from a shortage of naval escort, the U.S. naval attaché at Cairo was impressed enough to sum it up this way: "The enemy [is] now able to undertake operations in spheres previously beyond his capabilities."<sup>55</sup>

Furthermore, except for a strike on 10 February, another lean period now ensued for the antishipping sweeps. Success on the 10th involved Siebel ferries. These craft were crude but useful pontoon rafts capable, as the Allied airmen were to discover, of mounting considerable firepower, as much as two or three 88's and various light AA. However, nine B-25's pounced on four of them thirty to forty miles north of Cap Bon and probably destroyed the lot: one disintegrated and sank, two were left sinking, and one had its deck awash. Men, barrels, and boxes floated away. No more ships were sunk until the 21st, when the Kasserine battle was at its height. According to the group history, the 310th's B-25's had been dispatched to head off a tanker, and thirty miles south of Sicily they found what looked suspiciously like their prey. The 500-pounders fired the suspected tanker, sank two small escorts, and damaged a cruiser, the intense flak landing one B-25 in the sea. The

tanker, apparently the ex-Norwegian *Thorsheimer*, sank that day; Malta Beauforts may have put a torpedo into it before its dive. The Siebel ferries proved their mettle on the 23d. Thirteen of them shot down three of six attackers, but five more ferry cargoes went to the bottom. XII Bomber Command had scored a tactical success in its minimum-altitude bombing, but it was obvious that the enemy's countermeasures were gaining in effectiveness. New Allied tactics were needed and in time they emerged.<sup>56</sup>

Despite the fact that it shortly became the backbone of the Northwest African Strategic Air Force (NASAF), XII Bomber Command could scarcely be said to be performing strategic air operations as they were understood in the Eighth, or later, in the Fifteenth and Twentieth Air Forces. XII Bomber Command's overriding target was shipping—which it assailed at on- and off-loading points as well as during passage. The cargo carried by these ships could and did reach the front and affect the battle within two days of entering Tunis or Bizerte.

The Twelfth's role of cooperation with the land battle had been constant from the hopeful days of November when the first American bombers put their wheels down on the newly occupied African fields. On 20 January 1943 the Combined Chiefs of Staff had reaffirmed that role in a memorandum. In order of time the objects of Africa-based bombardment were to be: the furtherance of operations for the eviction of Axis forces from Africa; the infliction of heaviest possible losses on Axis air and naval forces in preparation for HUSKY; the direct support of HUSKY; and the destruction of the oil refineries at Ploesti. Without prejudice to any of the enumerated objectives, targets were to be chosen with a view to weakening the Italian will to war.<sup>57</sup>

The furtherance of operations for the eviction of Axis forces from Africa might and did mean almost anything, and the B-17's during January and February often interrupted their excursions to the ports to intervene even more directly in the land battle. On 11 January, five B-17's attacked the Libyan fort at Gadames in a mission probably coordinated with the operations of Brig. Gen. Philippe Leclerc's Free French column which had worked its way up from Fort Lamy. The crews peering down at the dust raised by their bombs reported direct hits on the fort, but subsequent photographs showed it to be undamaged.<sup>58</sup>

Somewhat more successful were the mid-January strikes against the Tripoli dromes, which were carried out in cooperation with the Allied

air in the Middle East. On 9 January the B-26's of the 319th inaugurated the program for the Twelfth by blasting the hangars at a field described as ten miles south of the doomed Libyan capital (probably Castel Benito). On the 12th, the 97th visited Castel Benito with a mixture of frags and HE, registered hits on and in front of the hangars, and reported bursts among the parked aircraft, twenty of which were claimed destroyed. The defender's response, besides flak, took the form of "twenty to thirty" Mc-202's which tried to avoid the P-38's and concentrated on the bombers in a twenty-minute fight. The B-17's claimed 14/3/1,\* one battered plane limping into Biskra two hours late, on two engines. The defending Italian unit admitted no losses, but claimed two "Boeings." On the 17th, RAF, ME apprised AFHQ that the backtracking enemy had plowed his forward airdromes and concentrated almost 200 planes on Castel Benito. With Middle East bombers being turned on that night, a strike by the B-17's was suggested for the 18th. The 97th sent thirteen B-17's and an exceptionally ample escort—thirty-three P-38's. The bomb load was entirely HE, perhaps because XII Bomber Command was suffering its usual lack of frags; it fell on the barracks and adjacent buildings. Twelve Mc-202's attacked, with the result that a P-38 and a B-17 were lost, but the bombers claimed 1/1/0, and the escort, 2/4/4. Spaatz, landing at Castel Benito after its capture, on his way back from Cairo towards the end of the month, commented favorably on the havoc wrought by the combined air of Middle East and Northwest Africa.<sup>59</sup>

In all probability as effective as its Castel Benito strikes was the blasting that XII Bomber Command's mediums and heavies administered to El Aouina on 22 January. El Aouina's damage was devastating. According to First Army intelligence, the B-17's hit an ammunition dump and inflicted 600 military casualties and, by the most conservative estimate, 12 parked planes had been destroyed and 19 holed in various degrees.<sup>60</sup>

As new fields became available on the Constantine plateau, XII Bomber's units were gradually shifted out of Biskra. The 301st went first—to Ain M'lila—where its air echelon arrived on 17 January. The 97th stayed on three weeks longer before occupying Châteaudun-du-Rhumel. The move began on 8 February and the men at first found the cold, rain, and sleet of the plateau much less palatable than the sun and

\* This conventional form of reporting indicates fourteen destroyed, three probably destroyed, one damaged.

dust of Biskra. The 1st Group's P-38's followed their charges back from the desert, and after 28 January the 14th Group ceased operations at Berteaux, turned a dozen remaining P-38's over to the 82d, and settled down to await the orders that would send it to the rear for rest and refitting.<sup>61</sup>

Among XII Bomber Command's duties in January was daily reconnaissance over the Gabès-Medenine-Ben Gardane road, clogged with retreat. The P-38's swept the area, sometimes in force. For instance, on 21 January two squadrons strafed until their claims of vehicles destroyed totaled sixty-five and came back safely, despite one P-38's ramming a telephone pole with its wing. Next day, however, ten enemy fighters broke up another scourging of the columns by jumping eight P-38's and destroying two of them. On the 23d a bitter running fight took place over the road. Sixteen P-38's claimed twenty-five to thirty vehicles destroyed, but they lost two of their number to enemy fighters and four others did not return—reasons unknown. On the 24th, perhaps in retaliation, bombers sought out the active landing grounds around Medenine. Weather prevented the heavies' attacking, but the B-25's and B-26's went in under the overcast to account for thirteen planes—parked, taking off, and airborne.<sup>62</sup>

Although the B-17's might sometimes take on such targets as the fort at Gadames or the bridges over the Wadi Akarit, unsuccessfully bombed on the 11th, their main preoccupation was still the harbors, where they frequently could subtract from the Axis merchant marine and Tunisian port capacity at one and the same time. Such a fortunate coincidence was reported as having occurred on 23 January at Bizerte. B-17's of the 97th Group sank a large merchant vessel in the channel near the naval base, while those of the 301st dropped their missiles on hangars, workshops, and oil tanks. All planes, including the escort, got back safely, reporting a fat toll of Axis interceptors.

So important were the ports considered that when Cannon asked permission on 31 January to attack the Elmas airdrome at Cagliari, "as a diversion both for our own and enemy forces," Twelfth Air Force replied that Trapani and Palermo were more vital objectives if the bomber commander wished to vary the heavily opposed Tunis-Bizerte milk-runs. However, on 6 February an Allied convoy was badly mauled between Oran and Algiers by Cagliari-based aircraft. The result was the Twelfth's first attack on a European objective. Fifty-one bombers, B-17's and B-26's, were put over Elmas airdrome on the 7th in

the space of three quarters of an hour. Results were good: bursts covered the field and hangars, destroyed an estimated twenty-five aircraft, and left large black-smoke fires. Five Me-109's were claimed to have been shot down and two of the IAF's Re-2001's damaged. All of the Twelfth's aircraft came safely back, apparently suffering little worse than having their radios jammed in the target area. That evening the Axis mustered only a weak assault on the convoy, and covering Beaufighters dispersed the threat.<sup>63</sup>

Save for attacks on Sousse and on Kairouan airdrome, the B-17's were inactive during the following week, but 15 February saw them over Palermo, kingpin of the supply route from Sicily. A large ship was left burning and the docks and dry dock were holed; no significant opposition occurred. Again, on the 17th, XII Bomber Command struck at the Sardinian airdromes, briefing the B-17's for Elmas and the mediums for Villacidro. The heavies' bombing was hampered by weather; they dropped long-fuzed, delayed-action 500-pounders, as well as frags. The mediums divided their frags between Villacidro's barracks and the parked aircraft at Decimomannu. Altogether one FW-190 and three Mc-200's were reported shot down, and the only loss to bombers or escort occurred when two B-26's collided over the target.<sup>64</sup>

### *Kasserine*

In mid-February 1943 the Axis held in Tunisia the most favorable position it could expect for the duration of the campaign. The Eighth Army was walled off by the Mareth fortifications, was hampered by bad weather, and was under the necessity of building up supplies through Tripoli. In the breathing spell before Montgomery could mount his attack, there was scope for an Axis smash at the ill-equipped French on the Eastern Dorsal or the largely untried American II Corps, which had assembled forward of Tebessa in January. In preparation, Rommel began to detach armor from his Afrika Korps: the 21st Panzer Division, partially re-equipped at Sfax, had put in an appearance at Faïd Pass on 30 January; two weeks later additional armor was moving northward through the Gabès gap. On 14 February the enemy launched an attack which, fully exploited, might have cut through the Dorsals, taken Le Kef, and, rolling northward to the Mediterranean, isolated the Allied forces facing Tunis and Bizerte. At the very least, the move would safeguard the Axis flank during the Eighth Army's in-



evitable smash at the Mareth Line. The chief point of assault was Sidi bou Zid, a subsidiary attack developing from Maknassy.

The defense of Sidi bou Zid rested upon two hill positions facing Faïd Pass—which according to II Corps report were not mutually supporting for antitank and small arms fire—and upon a mobile reserve in Sidi bou Zid itself. By nightfall of the 14th the enemy had overrun two battalions of American field artillery, inflicted heavy losses on counterattacking armor, and cut off completely the infantry on Djebel Lessouda. XII ASC threw in strafing and bombing missions, the A-20's bruising a tank column in Faïd Pass and participating in three missions against the southern horn of the enemy's advance, the most notable of which missions caught a convoy of perhaps a hundred trucks at an undispersed halt northwest of Maknassy. Moreover, on the way to the target, the escort broke up an enemy fighter-bomber raid.

During the night of the 14th, in view of the menacing situation at Sidi bou Zid, the small Allied garrison at Gafsa withdrew to Feriana. Next day the 1st Armored Division sustained heavy tank losses in an unavailing effort to extricate the beleaguered 168th Infantry on Djebels Ksaira and Lessouda; but some of Lessouda's defenders managed to escape during the succeeding night, the orders to retire being dropped by two P-39's. Contact was finally lost with the troops on Djebel Ksaira and with a battalion of tanks which had reached the outskirts of Sidi bou Zid during the counterattack.

At Thelepte the day of the 15th began with a strafing attack by six Me-109's which necessitated the recall of the first mission. Twelve Spitfires and two P-39's returned in time to destroy three of the raiders; but one Spit was downed, and an A-20 was strafed and destroyed on the ground. Early in the afternoon, in a move to reinforce XII ASC, two squadrons of the 52d Group arrived from XII Bomber Command (the other went to Youks). All day the Spits and P-39's strafed and patrolled in the region of Sidi bou Zid. Reconnaissance on the 14th having shown Kairouan airdrome well stocked with aircraft, Kuter at AASC called for bombers; and Spaatz detailed the mediums for AASC's needs on the 15th. Thirteen B-26's hit Kairouan first, the frags catching two aircraft taking off. Nine B-25's followed in a half-hour, finding three aircraft afire after the previous attack. Despite heavy flak which crippled a B-25 enough that the enemy pursuit finished it off, they laid their frags along the runways and in the dispersal areas, bombers and escort compiling claims of seven enemy fighters. The B-25's belonged to the 12th Group,

which had earned a commendable reputation with the Ninth Air Force. Two squadrons—the 81st and 82d—had flown from Gambut to Biskra on 3 February and subsequently moved on to Berteaux.

The 16th saw Combat Command A, harassed by dive bombing, in a bitter delaying action east and southeast of Sbeitla. By now it was apparent that the whole area east of the Western Dorsal was untenable. II Corps' losses—reported as 98 medium tanks, 57 half-tracks, 12 x 155-mm. and 17 x 105-mm. guns—rendered counterstrokes impossible. XII ASC did what it could in the deteriorating situation, its fighters furnishing cover and its light bombers attacking trucks, tanks, and gun positions. However, on the night of the 15th, Gafsa had been occupied by a small enemy column and the orders had gone out to organize Kasserine Pass for defense.<sup>65</sup>

Consequently, XII ASC had to evacuate its forward bases; and during the week of 13–21 February it abandoned a total of five, simultaneously maintaining a respectable level of air activity. This achievement reflected credit not only on the individual Air Corps units but on the advance planning of XII ASC and of Allied Air Support Command, the possibility of retreat having figured in headquarters calculations ever since the German stroke at Faïd Pass. On 10 February, Evacuation Plan A for Sbeitla and Thelepte had been disseminated to the interested commands.

The plan, which in the event was not followed to the letter, operated somewhat as follows: as preliminaries, Sbeitla, which lay most proximate to the front at Faïd Pass, was not to receive supplies in excess of a four-day level for one fighter group (no tactical units had yet arrived there); and the Thelepte fields—the engineers had constructed a second—were to have their stockage reduced to a four-day level for all resident units. Back at Canrobert a ten-day stockage was to be built up for the 47th's light bombers. Once the evacuation was ordered, the combat units would leave for Youks, Tebessa, and Le Kouif, stockage at the Thelepte fields would be reduced to a four-day level for one fighter group, and 3d Service Area Command would be responsible for removing the remaining supplies out of Sbeitla and Thelepte. XII ASC would assist to the maximum, determine priorities for movement of supplies and personnel, and destroy such equipment and stores as were likely to fall into enemy hands.

Signal for the execution of Plan A was withdrawal from Gafsa, and when the ground forces pulled out on the 14th, the plan was put into

effect as of 2200 hours—but for Sbeitla only. The time for the evacuation of Thelepte was left to Williams' discretion. In preparation for the reception of the 68th Observation Group, Sbeitla had been occupied by the 46th Service Squadron (as the situation developed, Kuter had never felt the base safe enough for the 68th). The service squadron was very nearly captured that night, but it not only got safely away but brought out with it seventy-five truckloads of supplies, a three-day level of munitions, and over 100,000 gallons of gas and oil.<sup>66</sup>

The valuable Thelepte fields were abandoned on the 17th as the Allied line was swung back on the Western Dorsal and the Germans and Italians drove in from Gafsa and Sbeitla. Fredendall had told Williams around nightfall of the 16th that his II Corps was dug in on high ground and expected to hold the line Sbeitla-Feriana. Nevertheless, at 2400 hours Williams was summoned again to corps to learn that the enemy had put in a night attack at Sbeitla and that the situation was serious. Holding forces at Kasserine and Feriana would endeavor to give XII ASC until ten the next morning to clear out of Thelepte. Williams, who had taken the precaution to spot transportation around Tebessa, gave the evacuation order shortly after midnight.

Thelepte had been partially cleared on the 16th when its two A-20 squadrons had been ordered out. The ground crews beginning preparations while the planes were away on business, by 2400 the squadrons were united with the rest of the group at Youks. This left to evacuate: Thelepte's two fighter groups (the 31st and the 81st), the Lafayette Escadrille, a squadron of the 350th (P-39's), and two squadrons of the 52d, altogether 124 operational aircraft. Missions were set up for the morning of the 17th, the aircraft to return to rearward stations. In the event, XII ASC was given plenty of time. The last mission went off at 1030 hours and a security detachment inspected the fields between 1100 and 1200. II Corps saw to it that the enemy did not arrive until the afternoon.

As planned, the 31st Group went to Tebessa, the P-39's to Le Kouif, the 52d to Youks. About 3,000 troops and most of the organizational equipment were got out of Thelepte. What could not be moved was destroyed: 60,000 gallons of aviation gas were poured out; rations blown up; eighteen aircraft, of which five were nonreparable, burned. Nothing was left for the enemy. Communications and supplies having been spotted previously at the new bases, operations continued uninterrupted during the day.<sup>67</sup>

By 18 February, II Corps had pulled back into the Western Dorsal and was busily fortifying the passes in the barrier: Sbiba, El-Ma-el-Abiod, Dernaia, and Kasserine. Everywhere on the hills guns were being emplaced and foxholes dug. The remains of Combat Command A moved from Sbeitla into the Sbiba gap where it was joined by elements of the First Army and the 34th Division. To watch over El-Ma-el-Abiod, Combat Command B moved into the region southeast of Tebessa, while Dernaia's three approaches were organized for defense by the former Gafsa garrison. Most heavily fortified was Kasserine Pass. In its defile the roads forked west to Tebessa and north to Thala; and except at the fork, communication between the roads was impracticable because the Oued Hateb was in flood. So not only was the pass itself manned for defense but the 26th Infantry dug in along the Thala road and the 19th Engineer Regiment went into position blocking the Tebessa route.

On the 17th, in the midst of II Corps' travail, Coningham arrived at 18th Army Group and assumed command of AASC, which in the reorganization next day became Northwest African Tactical Air Force (NATAF). The air marshal made himself felt at once. Upon perusing the operations summary for the 18th he was moved to cable all air commands deprecating the fact that almost all flying done by XII ASC and 242 Group had been defensive. Targets were in evidence, he said; bombers were on call but had not been utilized, nor had the fighters been used offensively. He advised his air commanders of what he had already told First Army and the three corps headquarters: umbrellas were being abandoned unless specifically authorized by NATAF. Hereafter the maximum offensive role would be assigned to every mission—the air marshal pointed out that an air force on the offensive automatically protected the ground forces. Moreover, tanks were to be let alone; enemy concentrations and soft-skinned vehicles were better targets.<sup>68</sup>

XII ASC's activity during the worsening weather of 18 February had consisted of but four missions: two reconnaissance and strafing at Sbeitla and Feriana and two troop cover over Kasserine, where the enemy was probing the defenses of the pass. The day of the 19th allowed no flying, offensive or defensive, bringing a sirocco with its accompanying dust clouds. The 20th proved little better. While XII ASC sat weatherbound, the Germans and Italians put their time to good advantage. The defenses of Sbiba resisted all attacks, but on the

night of the 19th the enemy infiltrated the high ground overlooking the American positions at Kasserine Pass. At daylight he attacked and broke through.

Energetic measures were by now in hand to meet the deepening crisis. The British 26 Armoured Brigade Group had come under II Corps' control near Thala on the 19th, and additional reinforcements were on the way. By the 20th, Spaatz had placed most of his strategic bombers (XII Bomber Command plus the two Wellington squadrons) at Coningham's disposal, an arrangement which obtained throughout the critical phase of the operations and was still observed on 24 February.

Under the force of the enemy drive, the 26th Infantry retired up the Thala road, compelling a sympathetic withdrawal by the 19th Engineers on its side of the Oued Hateb. Combat Command B, moving to the support of the engineers, went into defensive positions eight miles east of Djebel Hamra, and the 26 Armoured Brigade Group prepared to dispute an advance on Thala. On the night of the 20th, Robinett and the British commanders laid their defense plans. Robinett would attempt to restore the situation south of the Oued Hateb, while the 26 Armoured Brigade Group fought a delaying action to enable a battalion of the 5 Leicesters to stretch defensive positions across the road three miles from Thala. It was on the Thala road that the enemy was preparing his main effort; and it was imperative that he not reach the Leicesters before dark on 21 February.<sup>69</sup>

The 21st compassed a desperate struggle. The Axis debouched from Kasserine Pass, hit towards Tebessa with twenty tanks, and towards Thala with twice the number. Combat Command B contained all thrusts towards Tebessa and its huge dumps, but the 26 Armoured Brigade Group lost twenty tanks in the day's action. It maintained, however, the required delay; and when at 1945 the enemy broke the Leicesters' position, he was confronted by the artillery of the U.S. 9th Division which had spent four days and nights in a hasty journey from French Morocco. Orders were circulated that the line must be held at all costs.

Rain and fog prevented any really effective air activity on the 21st, although ten B-25's of the 12th Group achieved a raid on Gafsa's railroad yards and EAC's escorted Hurribombers struck at the enemy spearhead approaching Thala. Four times XII ASC got fighters off for reconnaissance and strafing; three times the weather forced them back,

only two P-39's boring through to strafe a tank and truck concentration. Another airfield, Tebessa, was abandoned, this time because of mud, the 31st Fighter Group's 307th and 309th Squadrons going to Youks (the 52d had been sent back to Telergma and Châteaudun-du-Rhumel on the 20th) and its 308th to Le Kouif. As the threat to Thala developed, Le Kouif and Kalaa Djerda were evacuated on the 22d, the 308th Squadron and the entire 81st Group being forced into Youks.

The 22d was the critical day. The Axis tide reached its flood. It beat against Sbiba where two newly arrived squadrons of Churchill tanks bested the Panzers in their first engagement. It pounded the defenses of Thala and Tebessa—without, however, breaching them. In the evening the enemy began a general withdrawal, hastened by an American counterattack which cleared him out of Bou Dries. All night the Allied artillery harassed his movements.

Thanks to partially clearing skies, the air forces were able to contribute to the final repulse, with XII ASC bearing the brunt. Youks, its only remaining forward base, was in full view of an ominous and apparently interminable procession of evacuated troops and materiel making for the comparative safety of Ain Beida and Constantine. Despite the fact that men not immediately needed for operations had been sent to Canrobert, Youks was an overcrowded field, entertaining delegations of various strength from the 47th Bombardment (L), the 31st, 81st, and 33d Fighter Groups, the 154th Observation Squadron, and the Lafayette Escadrille, besides service command personnel. Operations proceeded from one steel runway, on which a constant stream of transports and courier planes posed a substantial traffic control problem.

During most of the crucial 22d, Youks was out of communication with headquarters of XII ASC, which was being prepared for evacuation. However, operational policy had been established by a radio from Williams received the night before: all aircraft possible were to be put over the Thala area. Lt. Col. Fred Dean, commander of the 31st Fighter Group, who had on AASC's instructions been given command of all the fighters at Youks, consequently drew up a schedule of continuous missions for a dawn-to-dark assault on the enemy.

For an all-out aerial assault, however, 22 February left something to be desired. It began at Youks with a low ceiling and intermittent showers which persisted until midmorning. After the first bombers got off at 1135, XII ASC was able to crowd in the creditable total of 23



missions—114 sorties—but the A-20 crews could rarely see their bombs burst, and flew with the uncomfortable knowledge that interspersed with the low clouds were the high hills flanking Kasserine Pass. The only casualty, fortunately, was one A-20 which crash-landed after a brush with three Me-109's. Dean's fighters, which were continually taking off on reconnaissance and strafing missions, knocked down a Stuka and a Ju-88, which just about accounted for the local Luftwaffe's activities.

The hide-and-seek weather also hamstrung Strategic Air Force. Out of the missions airborne, three returned their bombs, and a wandering formation of B-17's, lost in the clouds, strayed 100 miles north and bombed friendly Souk-el-Arba. A dozen of the 12th Group's B-25's picked up Spitfire escort over Youks, but no one could say what damage they did to the bridge they attacked. Two squadrons of Strategic's P-38's, however, joined Williams' P-39's in strafing the Axis traffic in the pass.<sup>70</sup>

Next day all efforts were bent to punishing the retreat through the Kasserine defile. The ground forces got close enough by evening to put their 155-mm.'s to work on the pass, and the air forces concentrated on the backtracking columns on the other side of the Dorsal. The weather again was spotty.

In the days following 23 February, the Germans and Italians continued to fall back—their armor urgently needed in the south where the Eighth Army would soon be preparing its attack on the Mareth system. The Axis was still to launch heavy blows in Tunisia. Von Arnim shortly mounted an opportunist stroke in the Mateur-Sedjenane sector on the theory that the reinforcements rushed to Kasserine might have weakened the northern front; and early in March, Rommel pushed a spoiling attack at the Eighth Army which fizzled out in the face of the British artillery. But the Kasserine push had been the best bet to disrupt the Allied timetable. Its limited success had not been enough.

In its air phase the battle had given hopeful signs of a new cooperation. No longer did each packet of air fight on its own with its horizons limited to those of an army or corps commander. Eastern Air Command's Hurribombers and Bisleys had put in an appearance over Thala and Kasserine, and the weight of Strategic had been thrown into the scale. The Eighth Army and the Western Desert Air Force had responded by simulating preparations for an attack on the Mareth Line. The RAF 205 Group operated against Gabès town and airfield, light

bombers attacked in the Mareth region, and fighters and fighter-bombers moved forward into the Medenine area to torment the enemy air at Bordj Toual, Gabès, and Tebaga. It was an auspicious beginning for the new air force organization.<sup>71</sup>

### *Northwest African Air Forces*

February 1943 witnessed the marrying of the Middle East and Northwest African theaters of war. General procedures for the union had been laid down at Casablanca the month before in preparation for HUSKY, and the high headquarters had since been settling the details. After the conference breakup, Spaatz had accompanied Tedder to Cairo for discussions on organization and on the necessary coordination with the Middle East. On 30 January the pair left Cairo, visited IX Bomber Command, picked up Coningham, and arrived at Algiers next day. On 1 February a B-17 bore the air marshals away to England for a fortnight. By the 8th, Spaatz was writing Arnold that the detailed studies had been accomplished and the orders prepared—since 3 February a committee headed by Craig had been at work on the reorganization in Algiers. Issuing the orders awaited only Tedder's return.<sup>72</sup>

On the 20th, Eisenhower announced sweeping command changes in his ground and sea arms. General Alexander became deputy commander in chief of Allied Force and head of 18th Army Group, comprising the British First and Eighth Armies and the XIX French and II American Corps. Fleet Adm. Sir Andrew Cunningham succeeded Adm. Sir Henry Harwood as Commander in Chief, Mediterranean. Malta passed out of the Middle East Command, although it could not yet be supplied through the Sicilian narrows.<sup>73</sup>

The parallel integration of the air forces was intrusted to Tedder's Mediterranean Air Command, constituted and activated by AFHQ on 17 February, pursuant to the CCS directive of 20 January. MAC headquarters was a small policy and planning staff—"a brain trust without executive authority or domestic responsibilities"<sup>74</sup>—which commenced its work on 18 February in the building occupied by AFHQ. From the Middle East came Air Vice Marshals H. E. P. Wigglesworth as deputy to Tedder and G. G. Dawson as director of maintenance and supply, while the Ninth Air Force contributed General Timberlake as director of operations and plans. Craig became MAC's chief of staff.

For operations in Northwest Africa, MAC was subordinate to AFHQ. It was responsible for cooperation with the Tunisian armies;

for training and replacement of RAF and USAAF personnel; for supply and maintenance of the combined air forces; and for the protection of Allied shipping, ports, and base areas. Its counter-air force activities aimed not only to forward the Tunisian battle but to strip the aerial resources of Sicily and force the GAF to divert strength from the summer campaign in the U.S.S.R. By disrupting land, sea, and air communications, its strategic bombers would isolate the Tunisian bridgehead and interrupt the build-up of Sicilian defenses. The means at Tedder's disposal included the U.S. Ninth and Twelfth Air Forces; the RAF Eastern Air Command; RAF, Middle East; and RAF, Malta. He was also invested with operational control of RAF, Gibraltar.<sup>75</sup>

The administrative functions of MAC were performed by its three subordinate commands: Northwest African Air Forces (Spaatz); Middle East Air Command (Air Chief Marshal Sir Sholto Douglas); and RAF Malta Air Command (Air Vice Marshal Sir Keith Park). Except for Malta's passing under direct command of MAC, no significant change of function or organization occurred in the Malta or Middle East commands. To NAAF were sublet as many of the functions of MAC as could be performed from the NAAF base area and with the NAAF resources: neutralization of enemy air forces; cooperation with the Tunisian land battle; interruption of enemy communications by land, sea, or air. In addition, Allied shipping, ports, and back areas were to be protected, a central organization for supply of RAF and USAAF units set up, and provision made for training and replacement. Initially, NAAF, activated on 18 February, combined Eastern Air Command and the Twelfth Air Force (the Allied Air Force was abolished). On 21 February, Spaatz received control of the Western Desert Air Force.

The subcommands established under Spaatz were something new in air force organization. In the first instance they greatly extended the practice of combined headquarters inaugurated by Eisenhower's AFHQ in 1942. RAF and USAAF personnel were intermingled even below the command level, affording greater scope for mutual understanding and the pooling of ideas and techniques. As weighty in importance were the functional principles involved. The indecisive winter of 1942-43 had demonstrated that the standard U.S. fighter command could not easily be adapted to the manifold roles required of fighters in the African theater: port and shipping defense, bomber escort, and cooperation with ground forces. No more could bombers be segregated under a bomber command when they performed such diverse duties as

antisubmarine sorties, strategic bombardment, and strikes on enemy artillery positions.

Air Marshal Coningham took over the Northwest African Tactical Air Force, charged with cooperation with the Allied ground forces converging on the Tunisian bridgehead. Under him with the light bombers and fighters needed for the task were 242 Group (Air Cdre. K. B. B. Cross) for work with the First Army; Williams' XII ASC for work with II Corps; and Western Desert Air Force (Air Vice Marshal Harry Broadhurst) for work with the Eighth Army. Coningham established his headquarters in the Souk-el-Khemis area near 18th Army Group Advance and Anderson's First Army headquarters.

Doolittle was appointed to the Northwest African Strategic Air Force, composed of XII Bomber Command and two British Wellington squadrons and based with its own escort fighters generally on a group of airdromes around Constantine, where NASAF headquarters was set up. The Northwest African Coastal Air Force was directed from Algiers, where Group Capt. G. G. Barrett (shortly to be succeeded by Air Vice Marshal Hugh P. Lloyd) shared an operations room with Admiral Cunningham. NACAF was made responsible for the air defense of North Africa, for air-sea reconnaissance, for anti-submarine operations, and for protection of friendly and destruction of enemy shipping. It comprised 323, 325, and 328 Wings, RAF; the Headquarters and Headquarters Squadron, XII Fighter Command; 1st and 2d Air Defense Wings; and the U.S. 350th Fighter Group (P-39's).

The Northwest African Training Command fell to Cannon, who, since RAF training was mostly carried on in the Middle East, concerned himself in the main with American units. He was given a large number of airfields in Morocco and western Algeria. The XII Air Force Service Command and the maintenance organization of Eastern Air Command were combined as Northwest African Air Service Command under General Dunton, which event did not immediately affect their operations. Last of the combined organizations set up on 18 February was Lt. Col. Elliott Roosevelt's Northwest African Photographic Reconnaissance Wing which comprised the U.S. 3d Photographic Group and No. 682 Photographic Reconnaissance Squadron, RAF.

For his staff, Spaatz drew from the former headquarters of Allied Air Force, Twelfth Air Force, and Eastern Air Command. Robb carried over from Allied Air Force as deputy and chief of the RAF

element. For the rest, British and American officers were "interleaved." Establishing an administrative echelon at Algiers, Spaatz set up an operational headquarters at Constantine, where he could be in close touch with Doolittle.

The functional principles of NAAF, especially the provision of separate yet cooperating commands for the tasks of strategic bombardment and air-ground cooperation, were developed and widely applied by the Americans in the major theaters of war. Whole U.S. air forces became "strategic," e.g., the Eighth, Fifteenth, and Twentieth—while the Ninth and Twelfth evolved into strictly tactical air forces concerned with cooperation with the ground forces. What was at least as important, NAAF incorporated the principles of air warfare which had been learned in the Middle East and demonstrated more recently by hard experience in Tunisia. Its Tactical Air Force was a recognition (as the Allied Air Support Command had been before it) that the air forces cooperating with the ground battle had to be fought under a single air commander, since the planes, unlike the ground components, moved freely over the battleground and could be employed in any part of it.<sup>76</sup>

The outstanding exponents of Middle East doctrine now held key positions in the new setup: Tedder as head of MAC and Coningham at NATAF. On 16 February, in a talk at army exercises at Tripoli, the latter addressed himself to the general subject of air-ground cooperation. Preceding him, Montgomery had spoken on the same theme, but Coningham wished to amplify because, as he said, he attached great importance to proper doctrine. He stated the desert-evolved doctrine as follows:

The Soldier commands the land forces, the Airman commands the air forces; both commands work together and operate their respective forces in accordance with a combined Army-Air plan, the whole operations being directed by the Army Commander.

Coningham then discussed the fruitful applications of this doctrine during the long punishment of Rommel after El Alamein. In sad contrast, he said, was the state of the "home-doctrine" in England, where army-air feeling was characterized by a "mutual petulance" arising from an inactive home army calling constantly for training aircraft which the RAF, in continuous combat, did not feel it could spare. Mutual petulance, said Coningham, had accompanied the forces to French Africa—its net result the misuse of the air in the early Tunisian

operations. In the planning for TORCH the lessons of the Western Desert had been ignored.<sup>77</sup>

If such had been the case, there was at hand in Tunisia an opportunity to remedy it. In the large, the North African winter campaign had merely provided seasoning for all participating arms, British as well as American. A reorganization had been committed on paper; there would be work enough for all to make it fact.



## CHAPTER 6

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### *CLIMAX IN TUNISIA*

THE Kasserine push represented the zenith of Axis fortunes in Tunisia, and its impact weakened the Allied lines along the whole western face of the enemy bridgehead. II Corps was shaken; the British 5 Corps in the northern sector had been obliged to send formations to the defense of Thala and Tebessa; in the center, the French had not fully recovered from their January misadventures. General Alexander had recognized this situation in his first instruction to the 18th Army Group. The Allies on the western Tunisian front were still on the defensive; the immediate task was to wrest back the initiative. Alexander considered it most important to this purpose that the French, British, and American elements be disentangled and a beginning be made to form a general reserve.<sup>1</sup>

The Axis command moved immediately to exploit its expiring initiative. No sooner had its forces disengaged east of Kasserine than an attack developed in the British sector. Probably designed to take advantage of the temporary Allied weakness and cover the transfer of the 21st and half the 10th Panzer Divisions to the Mareth Line, the blow met a check before Bou Arada but broke into the British positions before Béja and eventually took Sedjenane and Tamera in the north, the latter successes denying the British 5 Corps the use of important roads in a generally roadless country. Containing this push and mounting a counterstroke to improve its positions in the Sedjenane sector involved 5 Corps in bitter fighting throughout a good part of March. The RAF 242 Group put forth maximum effort during these operations, being particularly effective on 28 February against tanks and motor vehicles around Sidi Nsir and Béja.<sup>2</sup>

Nevertheless, generally speaking, among the Allied forces north of the Mareth Line, late February and early March was a time of prepara-

tion—for the grand offensive which, it was hoped, would finally expel the Axis from the southern Mediterranean littoral. New formations were brought up, training was intensified, and operations proceeded throughout with an eye to conserving strength for the denouement. With HUSKY scheduled to descend on Sicily during the July moon, the Allied commanders were acutely conscious of the calendar.<sup>3</sup> Besides looking to training and reinforcement and overseeing the unremitting air operations, Spaatz' Northwest African Air Forces was still laboring with the implications of the 18 February reorganization.

One of the admittedly minor problems of the reorganization concerned the status of the Twelfth Air Force. Its units, personnel, and equipment having been transferred entirely to NAAF on 18 February,<sup>4</sup> both on paper and in actuality the Twelfth seemed to have vanished. At his last staff meeting, on 22 February, Doolittle expressed the opinion that once such matters as courts-martial had been wound up, the "skeleton" of the Twelfth—"the name only"—would have either to be returned to the States for a reincarnation or be decently interred by War Department order. Spaatz put the question to Eisenhower and, receiving answer that Headquarters, Twelfth Air Force, would be continued as the administrative headquarters for the U.S. Army elements of NAAF, he took command of the Twelfth on 1 March. As commander, however, he had no staff as such, it being assumed that AAF officers named to the NAAF staff had been automatically placed in equivalent positions in the Twelfth. Actually, all administrative functions were carried on by NAAF and the half-existence of the Twelfth served mainly to mystify all but a few headquarters experts.<sup>5</sup> The duties, units, and bases of Dunton's Northwest African Air Service Command were not set forth until 14 March,<sup>6</sup> the delay probably reflecting the Kasserine crisis. Four days later, as part of the preparation for HUSKY, NAASC lost its troop carrier units when the Northwest African Air Forces Troop Carrier Command (Prov.) was activated with Col. Ray Dunn as acting commander.<sup>7</sup> Dunn took over the 51st Troop Carrier Wing—60th, 62d, and 64th Troop Carrier Groups. A second troop carrier wing was already earmarked for the airborne invasion of Sicily, and in April, Dunn ordered all but one of his groups on training status.<sup>8</sup>

At NATAF headquarters in Constantine, Coningham was working to improve the theory and practice of air-ground cooperation. He realized that not only must he achieve unified control of operations but

must see to it that 242 Group and XII ASC were brought up to the approximate standards of the Western Desert Air Force, to which in point of experience and equipment they were markedly, if understandably, inferior. Before he and Alexander moved from Constantine to the neighborhood of Ain Beida (headquarters was in trailers originally commandeered in Egypt from visiting English tourists), an operational directive had been issued as a guide to the theory of NATAF's subordinate formations.<sup>9</sup> The doctrine was the familiar one from the Western Desert:

The attainment of this object [maximum air support for land operations] can only be achieved by fighting for and obtaining a high measure of air supremacy in the theatre of operations. As a result of success in this air fighting our land forces will be enabled to operate virtually unhindered by enemy air attack and our Air Forces be given increased freedom to assist in the actual battle area and in attacks against objectives in rear. . . . The courses of action I propose to adopt to achieve the object are:

(1) A continual offensive against the enemy in the air.

(2) Sustained attacks on enemy main airfields. . . .

The enemy must be attacked wherever he can be found, and destroyed. . . . The inculcation of the offensive spirit is of paramount importance.<sup>10</sup>

The comparative lull in air operations in early March was utilized by Coningham to reorganize his forces. XII ASC was near exhaustion from the cumulative effects of understrength units, mobile operations, and poor airdromes. The more urgent problems faced by NATAF consisted of the following: reorganization of the available tactical bombers; improvement of tactical reconnaissance and photography; development of the offensive use of RDF; and, finally, amelioration of the landing-ground situation.<sup>11</sup>

In mid-February the bombers available for army cooperation on the western face of the bridgehead were divided between 242 Group and XII ASC: Bisley squadrons of No. 326 Wing at Canrobert and XII ASC's battered 47th Group (A-20's), which had been recently reinforced from the Western Desert by two B-25 squadrons of the U.S. 12th Group, at Youks. Plans were immediately developed to combine these resources under one headquarters so that training for their specialized function could be undertaken and their total effort be made available for operations anywhere on the front. By 17 March the Bisley wing, of which one squadron was being rearmed with RAF Bostons, had moved to near-by Oulmène; the 47th was at Canrobert; the 12th, for which an RAF servicing commando was being transferred from Bône, was also at Canrobert, pending the completion of a field at Tarf. On 20

March, Spaatz' order activated the Northwest African Tactical Bomber Force, commanded, under Coningham's over-all direction, by Group Capt. L. F. Sinclair. Sinclair also exercised operational control of No. 8 Groupement of the French air force—LEO-45's specializing in night bombing from Biskra.<sup>12</sup>

One of the main weaknesses of tactical reconnaissance in the First Army-II Corps area consisted in the use of the available squadrons for offensive purposes—bombing and strafing. Consequently, NATAF had only to put an end to this to effect substantial improvement. The RAF No. 225 Squadron (Hurribombers), working with Anderson, was re-equipped with Spitfires. With II Corps, some improvement in tactical reconnaissance was accomplished by more careful selection of the personnel in the air support parties and of the ground officers used to brief the pilots. Battle-area photography had been poor, primarily because the Northwest African Photographic Reconnaissance Wing was based 300 miles back, at Algiers. Until NAPRW could get a detachment forward, therefore, reliance had to be placed on No. 285 Wing, serving the Eighth Army, and on the tactical reconnaissance squadrons. Late in the campaign the U.S. 154th Observation Squadron received P-51's equipped to take vertical and oblique photographs and it relieved NAPRW of battle-area photography for II Corps.<sup>13</sup>

The original USAAF units in the Tebessa-Kasserine area had no radar at all, and even at the end of February no more than a few LW's\* were in evidence, serving as air raid warning for the airfields. No. 242 Group was a little better off, but its system could not be used offensively. With the arrival of the U.S. 3d Air Defense Wing and the provision of additional British equipment for both 242 Group and XII ASC, NATAF finally achieved an excellent offensive layout overlooking the Axis airdromes in the coastal plain. As the Axis bridgehead contracted and was finally wiped out, the RDF installations moved forward until they were in place as part of a permanent coastal defense system.<sup>14</sup>

In February, 242 Group still struggled along with its fields in the Souk-el-Arba-Souk-el-Khemis region, badly placed among high hills for the cloudy winter but expected to be highly serviceable come spring. XII ASC's immediate difficulties were solved when II Corps secured the two Thelepte fields; the fighters moved back on 12 March after an unusually large number of mines had been extracted. The

\* Light warning sets.

Eighth Army's occupation of suitable territory around the Mareth Line's outposts alleviated WDAF's airfield problem, but NATAF was contemplating new construction in the northern and central sectors in preparation for an Allied advance.<sup>15</sup> New airfields for NATAF, however, could come only as part of a unified plan for airfield development, AFHQ having embraced the proposition that airfield construction could no longer proceed in response to immediate tactical requirements. This attitude reflected better appreciation of the role of air power; also, new fields had to be sited with an eye to the needs of the Sicilian campaign.

The most important meeting on airdrome construction during the African campaign took place at NATAF headquarters on 3 March. With Kuter and Coningham were the chief engineers for AFHQ, 18th Army Group, First Army, and NAAF. Two days later a directive was issued which gave NATAF thirteen forward fields, to be completed by 13 March, and NASAF fifteen fields in the region south and east of Constantine. The rear areas were given second and third priorities. NAAF, which interpreted AFHQ's policy of unified control as giving it the power to set airfield priorities, was subsequently resisted by the First Army, which commanded the British airdrome construction troops (the RAF had no aviation engineers); but on 24 April, AFHQ decided in favor of NAAF. Six months of confusion had ended with the realization that unity of command for airfield construction was as important as unity of command for aerial operations, indeed was the logical corollary thereof.<sup>16</sup>

The preparations on the western side of the Tunisian bridgehead had their counterpart in Tripolitania and the Mareth region as the Eighth Army, the Western Desert Air Force, and the Ninth Air Force girded themselves for an entry into Tunisia proper. After the capture of Tripoli on 23 January, Montgomery advanced west with only one division, his administrative position still precarious until the port could be got working. No great difficulty was encountered until the enemy stiffened on the approaches to Zuara, a small coastal town just south of the Tunisian border; for a day or two the RAF found targets among light vessels at its docks. Not until 30 January did Zuara succumb and the Eighth Army then faced up to Ben Gardane, the first outpost of the Mareth fortifications. At this point a rainy spell intervened and Ben Gardane was not entered until 15 February. With Leclerc's Free French column, now under Eighth Army command, working towards

Ksar Rhilane from Nalut, Montgomery next reduced Medenine with its important landing grounds and Fom Tatahouine.<sup>17</sup>

Since 6 February, Brereton had been commanding USAFIME as well as the Ninth Air Force, Andrews having succeeded Eisenhower in ETOUSA. Otherwise, the reorganization resulted in a fairly complicated command setup. To Air Marshal Douglas' RAF, ME headquarters had fallen command of all Allied air forces east of the Tunisian-Libyan border, with the exception of WDAF which was under NAAF for operations and Middle East for administration. Consequently, that part of the Ninth Air Force operating with WDAF passed under NATAF's operational control. To solemnize this arrangement Strickland's Desert Air Task Force Headquarters was succeeded by the "Desert Air Task Force, Ninth U.S. Air Force" with appropriate command channels; Strickland continued as commander. Other changes took place: Timberlake was called to Mediterranean Air Command and Colonel Rush succeeded him at IX Bomber Command on 15 February; when General Kauch also went to MAC in March, Col. John D. Corkille took his place as service command head on the 22d.<sup>18</sup>

In mid-February, the Ninth Air Force had only the 57th Fighter Group in the forward area, although two more P-40 groups—the 79th and 324th—were soon to become operational. The 57th occupied Zuara landing ground on 23 February, not having flown any missions since the 26th of the previous month. It immediately began fighter-bomber operations against the enemy air at the landing grounds around Mareth and Gabès, these operations being part of the campaign to draw hostile attention from the Kasserine area. On 1 March its advance party moved to one of the newly prepared Hazbub landing grounds south of Medenine and the group was made ready to follow. But early the next evening a large flight of Spitfires—the entire RAF 244 Wing—appeared over Zuara and were landed by the headlights of hastily rounded-up trucks. The wing had been occupying the Hazbub fields to which the 57th was scheduled to move, but the Germans had let go with guns concealed in the near-by mountains and sent out armored cars; this explained the hasty exit. The German gunners with their excellent observation from the Matmata hills were able occasionally to indulge in the sport of flushing the RAF from landing grounds in the plain. The 57th consequently stayed at Zuara until the 9th, when it advanced to a landing ground southwest of Ben Gardane.<sup>19</sup>

The 57th was initiating the new fighter groups into combat. The



79th's commander, its squadron commanders, its flight leaders, and its intelligence and operations officers all served with the 57th before the 79th began independent operations on 14 March from Causeway, a flat, semitidal sandspit jutting out towards the island of Djerba. One squadron of the 324th (the 314th) joined the 57th at Zuara and stayed with it for the remainder of the campaign. The other two (315th, 316th) joined the 79th at La Fauconnerie and Causeway, respectively. The remainder of the 12th Group—two squadrons were serving under NATAF in Algeria—moved up to El Assa on 3 March, in time to take part in the Mareth operations.<sup>20</sup>

In his advance from Egypt, Montgomery had been careful to preserve correct "balance," which he defined as the disposition of forces in such a way as to make it unnecessary to react to enemy blows: a correctly balanced force proceeded methodically with its operations. Not long after the Eighth Army's arrival in Tunisia, however, it was forced to react to Rommel's maneuvers and so caused its commander some anxiety.<sup>21</sup> The occasion arose out of the necessity for a diversion during the Kasserine battle: Montgomery, demonstrating before the Mareth Line, found the 15th and 21st Panzer Divisions and part of the 10th, withdrawn from Kasserine, concentrating against him. He had only two divisions forward (supply had prohibited more) and had consequently to rush the New Zealanders up from Tripoli. They arrived in time to help fend off the one-day Axis attack of 6 March.

Forced also to assemble rapidly in the forward area, WDAF had been active with fighter-bombers against the concentrating Axis columns and had combated the GAF attempts to support the abortive attack; but targets had not been very remunerative and the weather had turned bad. The Eighth Army artillery gave a good account of itself—fifty tanks were killed. Rommel left Africa on sick leave. The Axis initiative was at length totally exhausted, and the first step in the liquidation of its Tunisian bridgehead could now be taken.<sup>22</sup>

### *Constriction of the Bridgehead*

The first requirement of the Army plan for the early destruction of the Axis in Tunisia was to get Montgomery north of the Gabès gap to the coastal plain where in concert with II Corps he could exploit his mobility and striking power. During this phase, First Army and II Corps would endeavor to draw enemy reserves from the Mareth system, which was generally conceded to be a hard nut to crack, even for

the Eighth Army.<sup>23</sup> Montgomery planned to move during the March moon. On the first of the month Anderson was directed to prepare an offensive in his southern sector, to be ready to roll by the 15th. The specific objective was Gafsa, where a forward dump for the Eighth Army would be established. Having securely garrisoned Gafsa, the force would move towards Maknassy to menace the enemy LOC from Gabès. An essential prerequisite was the reoccupation and clearing of the Thelepte airdromes. To this operation was assigned the code name WOP, and Patton's II Corps had the responsibility for its execution.<sup>24</sup>

II Corps had been considerably enlarged since its debut in central Tunisia in January. Patton could dispose two infantry divisions for the static defense of the approaches to Robaa, Sbeitla, and Feriana while with an infantry and an armored division he undertook a drive on Gafsa. Gafsa once taken, II Corps would develop operations towards Maknassy in accordance with instructions from 18th Army Group.<sup>25</sup>

The air contingent for WOP comprised Williams' XII Air Support Command—three fighter groups and a tactical reconnaissance squadron—to operate from Thelepte and a detachment of the Tactical Bomber Force to operate from Youks. Between them, XII ASC and TBF would secure and maintain a high degree of superiority over the enemy air forces so that WDAF could perform uninterruptedly in aid of the Eighth Army's assault on the Mareth Line, scheduled for three to four days after the inception of WOP.<sup>26</sup>

NATAF's planning assumed that Montgomery would surmount the Mareth obstacle. So airfields were to be prepared not only in the Thelepte-Sbeitla area, for the WOP operation, but around Le Sers and Le Kef and in the Souk-el-Khemis area. From these latter fields the Axis retreat through central Tunisia could be discomfited, and on them air power would be sited for the final crushing of the bridgehead. It was anticipated that XII ASC's radar would be moved northeastward to cover Kairouan; and thought was being given to establishing a common standard of fighter control for XII ASC, 242 Group, and WDAF so that in the final phase fighter operations could be controlled from the most convenient sector.<sup>27</sup>

Arrangements had also been made to secure NASAF's participation in the impending operations. Montgomery had originally requested, in a letter to Alexander of 27 February, heavy bombing attacks on the enemy rear areas about Gabès during the week preceding his attack and for D-day a tremendous, day bomber attack by every available

B-17.<sup>28</sup> Broadhurst passed on the request through Coningham: half the Strategic Air Force bomber effort during the critical period of the attack and for 21 March the maximum SAF effort. Spaatz' reply was more conservative: he agreed to the use of Doolittle's mediums, minus the two squadrons reserved for shipping strikes, for the critical period; on 21 March the B-17's would be available, unless particularly lucrative shipping targets were discovered.<sup>29</sup>

Coningham's instructions to Williams for the WOP project were fairly precise. XII ASC's fighters would be flown offensively in the areas where the enemy air force would likely be encountered, not in defensive umbrellas over friendly troops (unless enemy air attacks proved persistent). The P-39's (81st Group) would be employed for ground strafing, but not the Spits (31st and 52d Groups). The minimum scale of daily tactical reconnaissance was to be agreed on with the corps commander; additional requests would be met insofar as available fighter escort permitted, this to be clearly explained to the corps commander. Forward airdromes would not be occupied without NATAF approval.<sup>30</sup>

Employing the 1st Armored and 1st Infantry Divisions, Patton's attack jumped off on the night of 16/17 March. By noon of the 17th, Gafsa had fallen and next day the armor pressed on to Sened. Held up by rain for a time thereafter, it took Sened Station on the 21st and, pushing up the Gafsa-Mahares road, occupied Maknassy on the 22d; by the 23d it had reached the pass beyond. Meanwhile the infantry, driving southeast, had found El Guettar abandoned and sited its anti-tank guns fifteen miles to the east along the Gafsa road. On the 23d the enemy attacked with tanks and infantry and, although he was beaten off, the II Corps front thereafter was stabilized, by and large, until the Eighth Army had got north of Akarit.<sup>31</sup>

During the first two days of the offensive, TBF and XII ASC concentrated on the immediate battle area. Gafsa was attacked, prior to its capture, by the 12th Group's B-25's and, no enemy aircraft appearing, the escort came down to strafe. Reconnaissance and strafing thereafter went forward on a reduced scale as the fighters were needed for escort on the TBF/NASAF campaign against the enemy air. However, when on 23 March the Axis counterattacked II Corps, TBF switched its effort long enough to carry out highly successful bombing on concentrations east of El Guettar.<sup>32</sup>

With the replacement of defensive cover flying by offensive fighter

sweeps and the use of radar against the occasional "bandits," the pattern of XII ASC's operations differed materially from that which had characterized the Faïd-Kasserine campaign. The sweeps, mostly in the El Guettar area, paid off handsomely: in the period 23 March-3 April, sixty enemy planes were reported destroyed, as against fifteen Allied aircraft lost and missing. Previously, by its own admission, XII ASC's losses had been greater than its victories. The Allied air was beginning to exploit its numerical superiority. TBF continued to divide its attention about equally between counter-air operations and battlefield bombing. Especially fine road targets appeared when the retreat from Mareth to Wadi Akarit was on, and TBF then supplemented WDAF's light bombers. From WOP's D-day to the retreat to the Wadi, bombing of enemy concentrations produced claims of 14 tanks and 129 M/T destroyed. Moreover, escorted by Spitfires, XII ASC's P-40's (33d Group) began regularly doubling as fighter-bombers.<sup>33</sup>

The demise of the umbrella did not occur without protest. Messages from Patton on 1 and 2 April complained that his divisional command posts and forward troops were being continually bombed; that because of total lack of air cover German air forces had been able to operate above his units almost at will. The GAF commanders contemporaneously being bombed out of their airfields would not have agreed; and Coningham's reply made it clear that containing the enemy at his bases and running sweeps against him in the forward area was the proved remedy and would be continued: NATAF would not revert to defensive tactics.<sup>34</sup>

The offensive against the enemy air which NAAF unleashed in southern Tunisia in March, with the immediate object of quelling air opposition to the WOP-Mareth operations and so releasing WDAF for unstinted cooperation with the Eighth Army, was the opening round in an unrelenting campaign which was to drive the GAF and IAF from airfield to pock-marked airfield and, in the end, entirely out of North Africa. At the outset, the greater part of the Axis air strength in southern Tunisia occupied bases at Tebaga and Gabès, in the rear of the Mareth Line, and at Mezzouna, fifteen miles east of Maknassy, from which the entire southern face of the bridgehead could be covered. NASAF's mediums struck the first blow on 15 March with two heavily escorted attacks on Mezzouna, most favorably placed to menace II Corps' attack. Bad weather then delayed the program until the eve of the Mareth battle.<sup>35</sup>

On the 19th, while the rains held NASAF at its bases, TBF's bombers, dropping through breaks in the overcast, commenced a series of raids on the landing grounds at Gabès and Tebaga. NATAF designating the objectives, the agreed NASAF effort then came into play on a schedule arranged to minimize any lull while WDAF refueled and rearmed. NASAF mediums attacked Gabès and Tebaga on the 20th; and next day 76 B-17's joined to bring the total sorties against these fields to 281 over a three-day period. The first stage of the enemy air's withdrawal was the evacuation of Mezzouna and Gabès. Tebaga did not long remain tenable. A-20's and B-25's from TBF cooperated with NASAF's mediums to this end on 24 and 25 March—twenty-eight aircraft demolished by the bombardment were left on the field. The GAF retired to Sfax and La Fauconnerie.<sup>36</sup>

Sfax, harboring night bombers, lay beyond XII ASC's fighter range and so, except for TBF's night attacks, its field fell to WDAF for attention when the ground situation permitted. NASAF having retired from the counter-air campaign, TBF began on 30 March the systematic reduction of the La Fauconnerie group, which was heavily reinforced with AA from the abandoned southern fields. To mark the RAF's 25th birthday NAAF had planned visits in force to airfields from Sfax to Sicily, but bad weather interfered: except for strikes at La Fauconnerie and El Djem the American effort was canceled. The tempo of the attack on the La Fauconnerie group nevertheless mounted day by day, 242 Group's Hurribombers joining in, until on 6 April seven A-20 and B-25 missions were laid on. The La Fauconnerie fighters, with all they could do to defend themselves, were no longer a threat. On 7 April, forty-eight hours before the ground situation demanded, they pulled out. By the 10th the Axis Tunisian air force lay wholly within the bridgehead Enfidaville-Medjez-el-Bab-Pont-du-Fahs.<sup>37</sup>

XII ASC evened an old score by finally routing the Stuka. Escorted Ju-87 and Ju-88 attacks on II Corps' spearheads had intensified as the troops advanced, and these attacks reached a peak on 1 April with eighty-seven aircraft active in the El Guettar area. However, XII ASC began using Gafsa as an advanced landing ground, and seldom did the enemy get away without loss. In the late afternoon of the 3d, elements of the U.S. 52d Group caught a score of Junkers, escorted by fourteen fighters, just after bombing II Corps. Fourteen Stukas were destroyed for the loss of one Spit. Not long afterward, to the regret of

Allied fighter pilots, the Ju-87 was withdrawn from Africa.<sup>38</sup> The WOP operations also witnessed the debut of the Spit IX in southern Tunisia. A squadron of IX's acting as rear cover for the bombers returning from Tebaga sprang a tactical surprise on the Me-109's, seven of which were reported knocked down for no loss to the Spits.<sup>39</sup>

The Mareth Line had been built by the French against an Italian incursion from Libya. Stretching from Zarat on the coast to the Matmata hills, its northern portion featured in the widened and deepened Wadi Zigzaou an effective antitank ditch. South of the Medenine-Gabès road were less continuous tank obstacles, numerous strongpoints, and artillery emplacements capitalizing on the observation from the near-by Matmata. West of the hills and between them and the sand dunes ran a forty-mile corridor, believed at the time of the line's construction to be impassable. Not long before the war, maneuvers having demonstrated otherwise, the French hastily added a switch line at Djebel Tebaga. They had planned to hold the position with two divisions in the main line, two in reserve at Mareth, and one or two additional to cover the corridor. The 1943 battle followed very closely the earlier French conception.<sup>40</sup>

General Giovanni Messe, who had succeeded Rommel, initially disposed his German and Italian infantry in the Mareth fortifications with the armor in the rear, the 15th Panzer close up, the 21st guarding the Tebaga gap. Montgomery, who had sent his Long Range Desert Group into the area, realized the possibilities of the corridor west of the Matmata and advanced with a flanking movement in mind, keeping Leclerc's force well forward as a screen. Leclerc, at Ksar Rhilane, so disturbed the Mareth defenders that on 10 March armored cars were sent out to attack him. WDAF, which answered to the call with Hurricane IID's—"tank busters"—Kittybombers, and Spits, materially assisted the French in beating off the attack.<sup>41</sup>

Montgomery grounded his plan for breaking the Mareth Line on the assumption that the opposition could not withstand two major attacks: if it concentrated against one, the other would be reinforced and driven through. So, while a division and an armored brigade attacked the coastal sector, the 2 New Zealand, strengthened by Leclerc and other formations, would move down the corridor west of the Matmata hills, proceeding by night marches until discovered. As the date for the attack approached, WDAF concentrated on the Mareth defenses themselves, in accordance with Montgomery's appreciation that they



could not be broken by ground action alone. TBF, NASAF, and XII ASC meanwhile taking on the Luftwaffe, WDAF and the Eighth Army worked without substantial interference from the enemy air.<sup>42</sup>

The Ninth Air Force elements in position directly to take a hand in the Mareth battle were the two veteran groups, the 12th (minus two squadrons) at El Assa and the 57th, with one squadron of the 324th under its tutelage, in the Medenine-Ben Gardane area. The 79th, also with a squadron of the 324th, operated from Causeway. With the enemy air being largely contained by XII ASC and TBF, fighter cover for light, medium, and fighter-bomber missions was kept to a minimum and was successfully furnished by the new 79th. The B-25's operated both by day and by night, mostly in attacks on enemy concentrations in the battle area. The 57th flew in its normal role—sweeps, strafing, and bombing missions. That the opposition still had teeth to be drawn was demonstrated on a sweep over Gabès on 13 March. Thirty-six P-40's of the 57th and 324th Groups with a top cover of Spits ran into heavy AA and around thirty Me-109's and Mc-202's which concentrated on the top P-40 squadron. Four P-40's and three pilots were lost, but the Spits claimed one and the P-40's four of the attackers. For three days thereafter, the enemy fighters could not be brought into combat.<sup>43</sup>

The 20th of March dawned clear, enabling WDAF to take some badly needed photographs. Around midnight the coastal attack went in across the Wadi Zigzaou. At dawn of the 21st, 50 Division was in possession of strongpoints on the northern bank. Meanwhile, New Zealand Corps, 27,000 strong with 200 tanks, was making its way towards the switch line between Djebels Tebaga and Melab; abandoning any idea of deception, it marched by day as well, and by dark of 20 March had almost closed the enemy positions southwest of El Hamma. WDAF supported this thrust mostly with fighter-bombers, reserving the medium and light bombers for the coastal sector where the infantry was involved in a bitter struggle.

Rain, which filled the Wadi Zigzaou and partially isolated the bridgehead and also prevented WDAF from blasting an impending counter-attack by German reserves, sealed the fate of the coastal thrust on 22 March. Montgomery thereupon sent an armored division and a corps headquarters to reinforce his southern column before the switch line, mounted a thrust against the gaps in the Matmata to shorten his communications, and evacuated 50 Division on the night of 23/24 March. Feints and air and artillery bombardment were employed to

detain the German reserves in the coastal sector. The P-40's and B-25's had been active in furthering 50 Division's attack, particularly on 22 March when enemy concentrations were bombed near Zarat. On this occasion the GAF and IAF came up to fight. One B-25 failed to return as the escorting P-40's compiled claims of enemy fighters probably destroyed and damaged. On the same day, the Hurricane IID tank busters—the RAF called them “tin openers”—had one of their few successful shoots: nine tanks destroyed out of a force operating against New Zealand Corps.<sup>44</sup>

At the switch line, even after 1 Armoured Division had arrived, the situation looked none too prosperous. The enemy had laid mine fields and enjoyed good observation and antitank guns in the hills flanking the gap. Besides Italian formations, the 21st Panzer Division was in place, backed up by the 15th Panzer and the 164th Infantry. Lt. Gen. Bernard C. Freyberg, commanding the New Zealand Corps, believed that lengthy outflanking operations were necessary, operations manifestly difficult to supply. In the circumstances, the Eighth Army staff held earnest conversations with Broadhurst. Broadhurst suggested an intensive low-flying daylight attack on a narrow frontage—an attack designed to take advantage of the fact that the enemy was not dug in and his flak was weak; behind a creeping barrage the tanks and infantry would then attempt to pierce the gap before further enemy reinforcements could be brought into play. The proposed low-altitude work represented a departure for WDAF, which had apparently eschewed such intimate support lest the wastage hamper the maintenance of air superiority. In preparation, on the two nights preceding the battle, all available bombers were thrown at the enemy armor.<sup>45</sup>

At the landing grounds on the morning of the 26th a bad sandstorm was blowing, but it cleared in the afternoon and the assault, in which the U.S. 57th and 79th Groups participated, fell on the Axis at El Hamma out of a sunny and dusty sky. First into the attack flew three escorted light bomber squadrons, followed by the tank busters; thereafter two and a half squadrons of P-40's (Kittybombers) were fed in every quarter hour to bomb selected targets and strafe gun positions. The operation, carried out at low altitude, achieved unqualified success, the creeping barrage furnishing a first-rate bomb line. A constant patrol of Spitfires guarded against air interference, but NATAF was keeping the enemy busy at his home airfields. Eleven pilots were missing after the two-and-a-quarter-hour blitz.

By nightfall the New Zealanders, followed by 1 Armoured Division, had broken into the Axis positions, and the armor passed straight through in a moonlight operation. Next day the enemy fought desperately in a confused *mêlée*, but the Mareth position had been turned. Evacuation began on the night of the 27th and, sandstorms intervening, proceeded virtually unbombed on the 28th. On the 29th, however, the P-40's contributed to 418 strafing and bombing sorties on the coast-road traffic as far north as Mahares. Attacks were also made on landing grounds at Zitouna, Oudref, and Sfax. The Ninth Air Force sustained in these operations the loss of three P-40's and a B-25. By 29 March the British were in Gabès.<sup>46</sup> In retrospect, the low-level air attack on the switch line had contributed mightily to the uncovering of the Mareth defenses. According to the Eighth Army's chief of staff, De Guingand, higher RAF quarters tended to play it down out of apprehension of constant army demands for this type of mission;<sup>47</sup> at any rate, the Air Ministry was interested enough to request a report on the principles and methods employed.<sup>48</sup>

Badly weakened by his recent hammering, the enemy now lay in the Gabès gap, where the sea and the Chott el Fedjedj were only fifteen miles apart. Across the interval stretched the Wadi Akarit, not so wide as the Wadi Zigzaou but dominated by steep-sided hills on its northern bank. The first five days of April were spent by the Eighth Army in preparing to force this last gateway to the coastal plain. WDAF, although hampered by three days of bad weather, turned the time to account by laying on light bomber missions against Sfax/El Maou, a nest of Me-109's and Mc-202's and a staging field for Sicily-based Me-210's and Ju-88's. On the morning of 6 April the Eighth Army attacked and a day of bitter fighting followed. WDAF threw in heavy, light, and fighter-bomber missions against counterattacking forces, in which missions Ninth Air Force elements bore full share. Exhausted by Montgomery's pressure, the enemy pulled out the next night.<sup>49</sup>

The forcing of the Wadi Akarit unhinged the whole southern front. On the 7th, II Corps and Eighth Army had joined patrols east of Maknassy. Everywhere the enemy was in flight and nowhere was he out of range of the Allied air forces. On 7 April all available XII ASC and WDAF aircraft attacked the backtracking columns with devastating effect and slight enemy air interference. XII ASC and TBF concentrated on the Chemsî Pass, southeast of El Guettar, with A-20's, B-25's, and P-40's all bombing.<sup>50</sup>

WDAF continued the program on the 8th, but XII ASC was grounded by weather. Next day XII ASC turned its attention to the central sector where 9 Corps had designs on Fondouk Gap and Kairouan. From Kairouan the forces fleeing north from Akarit could be cut off. For this operation, the U.S. 34th Division came under 9 Corps command and XII ASC moved completely into the Sbeitla airdromes (the 33d Group, which had rejoined after a sojourn in the rear areas, had been operating from Sbeitla 1 since 10 March). The attack jumped off on 8 April, took the pass on the 9th, and Kairouan on the 11th. Nevertheless, the enemy, who had rushed in reinforcements, had been able to impose sufficient delay and had got his forces safely north of Kairouan (in the process, however, his dwindling armor had absorbed further punishment from the British 6 Armoured). From the point of view of air-ground cooperation, the Fondouk drive also left something to be desired. Communications were bad and 9 Corps lacked experience in coordinated air-ground effort under battle conditions. Premeditated attacks, part of the original plan, were canceled at the last minute; when called for again there was not time enough to carry them out. Little enemy air activity was observed, but on the afternoon of 9 April the U.S. 52d Group caught two formations of Ju-88's and knocked down eight for the loss of a Spit.<sup>51</sup>

While WDAF was preparing for its final African move—to the Kairouan-El Djem-Hergla area—XII ASC bore the brunt of punishing the retreat, 242 Group joining with its Spits and Hurribombers as the enemy drew within range. XII ASC then moved to the Le Sers region from which its aircraft could cover the whole bridgehead; by 12 April it was clear of the Thelepte-Sbeitla area. TBF's day bombers, which had come forward to Thelepte in early April, transferred to Souk-el-Arba, convenient to escort from 242 Group. The night bombers remained at Canrobert and Biskra.

On 9 April, NATAF headquarters had opened at Haidra in the center of the battle line. A week later, moving again to Le Kef (where the headquarters was not concealed from the air), the NATAF-18th Army Group caravans intersected the line of march of II Corps' four divisions on their way north to Béja, moving bumper to bumper, day and night. The stage was being set for the liquidation of the Axis investment in the African continent.<sup>52</sup>

*Isolation of the Bridgehead*

On 18 February, while Spaatz was activating NAAF at Algiers and II Corps and XII ASC were feverishly preparing the defense of the Western Dorsal, an advance detachment of IX Bomber Command headquarters pitched camp at Berka Main, once the principal civil flying field for the Bengasi area. The B-24's were undertaking another move, their third since Palestine days; this one had been planned at least since November, but was delayed by the familiar logistical difficulties. The command's two groups pulled up stakes at Gambut, journeyed westward, and soon were disposed at a semicircle of airdromes south of the battered Italian port. Not involved in the move was the 93d, which, having come into Tafaraoui in December in expectation of a ten-day African stay, was finally restored to the Eighth Air Force; late in February it flew north for England.<sup>53</sup>

Headquarters and two squadrons (345th and 415th) of the 98th Group settled at Benina, to the east of Bengasi. The other two squadrons inherited a site near by, styled in the Italian *Lete* (*Lethe*) because of its proximity to the underground stream which in ancient times was thought to lead directly into Hell. Whatever its dismal associations, *Lete* had an all-weather strip. The 376th Group, under its new commander, Col. Keith Compton, moved into unsurfaced Soluch, thirty miles south of Bengasi, where, if relatively isolated, it was solaced by the neighboring duck ponds, the denizens of which were utilized to vary C rations. The RAF's 178 Squadron moved into a spot on the Tripoli road baptized *Hosc Rau*, and operations commenced from the Bengasi complex.<sup>54</sup>

From the first they were plagued by the elements. On 24 February and 1 March, the B-24's were able to bomb despite the haze over Naples; but on 13 March a formation encountering heavy overcast failed to reach the target. On 23 February, however, the air over Messina was passably clear and the ferry slips took a direct hit; fires and explosions also resulted and a ship in the harbor was hit or very nearly so. On 24 March, eighteen B-24's in two formations returned to hit the western end of the building which housed the operating gear and to damage one of the ferries. Considerable havoc was also wrought on this occasion on the U-boat base.<sup>55</sup> The bad weather often protecting Naples must have sorely tried the inhabitants of Crotone, a town on the ball of the Italian boot which had the misfortune to be on the direct

route home to Libya and to contain a chemical factory of some importance. B-24's frustrated by clouds over Naples almost invariably called at Crotone, and although some very effective attacks were made on the chemical plant, bombs sometimes fell in the town.<sup>56</sup>

On 12 March, IX Bomber Command headquarters completed its transfer from the Delta by establishing itself in three buildings adjacent to Berka; from the flat roof of the largest the take-off from Berka 2, Lete, and Benina could be observed. A week later, Colonel Rush was ordered back to the States and was succeeded by Colonel Ent. American aviation engineers began to take up maintenance and construction duties at the Bengasi fields. The 812th Engineer Aviation Battalion arrived in March, a unit which since mid-1942 had been constructing airdromes in Kenya, developing a southern ferry route across Africa against the possibility of the interruption of the Takoradi-Khartoum artery. At the very end of the campaign, C Company of the 835th Battalion was also at work at Bengasi.<sup>57</sup>

The third week in March was taken up by weather-ridden missions to Naples. On one occasion, the 98th Group came back to find the Bengasi area blanketed with low clouds and soaked with rain which rendered every field but Lete unserviceable. One by one, in the brief intervals when the clouds lifted, the B-24's slipped into Lete, turned off the strip, and mired fast. All had to be pried loose next morning. The ferry building at Messina continued to defy the best efforts of the command (it did so even to the end of the Sicilian campaign); but in late March and early April the B-24's made gallant attempts to obliterate the pinpoint target. The risky method devised by the planners involved three B-24's taking off from Malta (Luca), making a great circle around Sicily in darkness, assembling, and, on the deck, sweeping down on the strait from the west. On 28 March low clouds spoiled the attack. Two B-24's, however, chose alternate targets—Vibo Valentia airfield and Crotone; the three tons of bombs salvoed on the chemical works from fifty feet caused tremendous damage. On 1 April, three more B-24's left for Luca, and two finally attacked Messina. After 178 Squadron disturbed the repose of the defenders, the B-24's bore down on the strait, full throttle. One string of bombs tore a gaping hole in the parapet of the Messina terminal. On its way to San Giovanni, the second B-24 ran into a big convoy of Ju-52's, shot down a transport, drove off two Me-109's and a Ju-88 from the escort, and still dropped its bombs in the target area.<sup>58</sup>

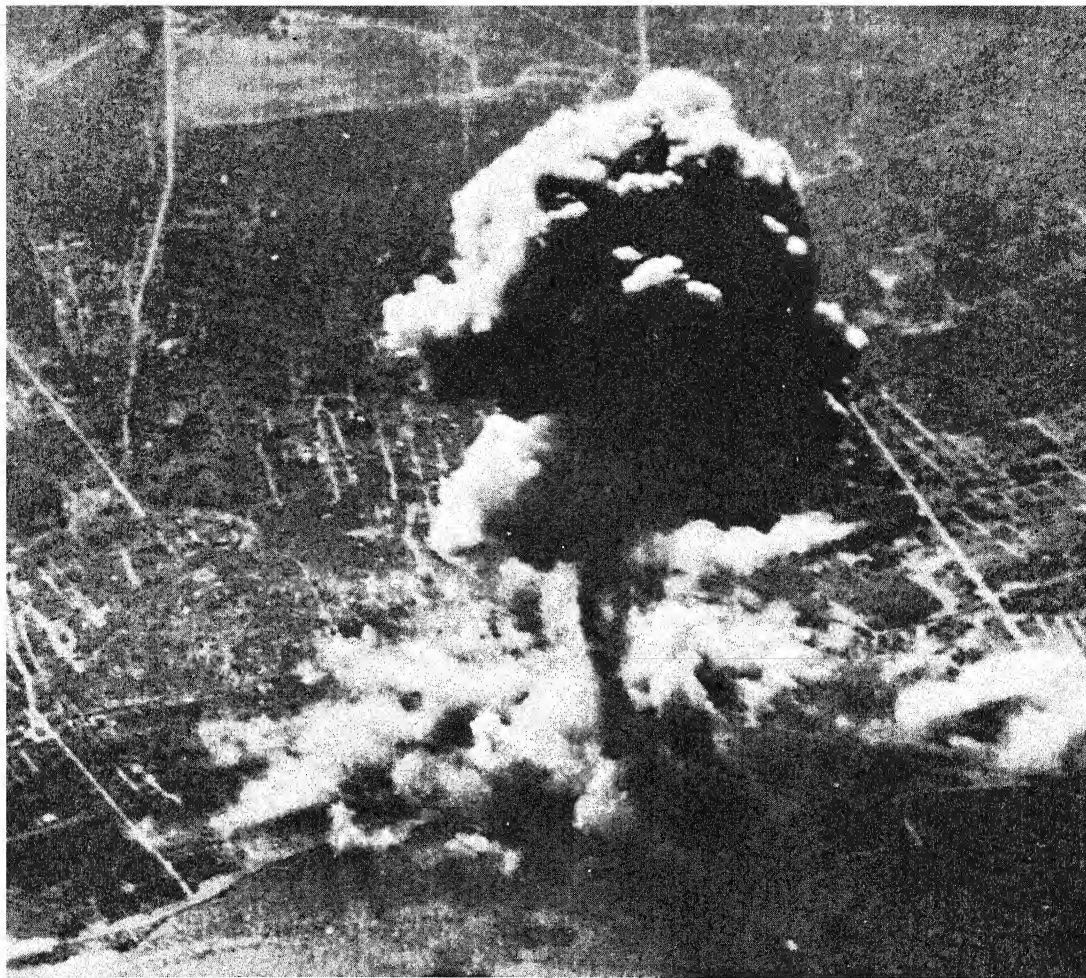


The command tacticians had been given food for thought by the 24 March mission against Messina when enemy fighters inaugurated air-to-air bombing with salvoes of small time-fuzed bombs with bright markings, so raising the perennial question of the relative advantages of tight or loose formations. The first success of these devices occurred over Naples on 11 April: a B-24's tail was blown off. Nevertheless, the port took a pounding: in two raids (10 and 11 April) the harbor moles and shipping were hit and five interceptors reportedly shot down. Moreover, air-to-air bombing never became a first-class menace.<sup>59</sup>

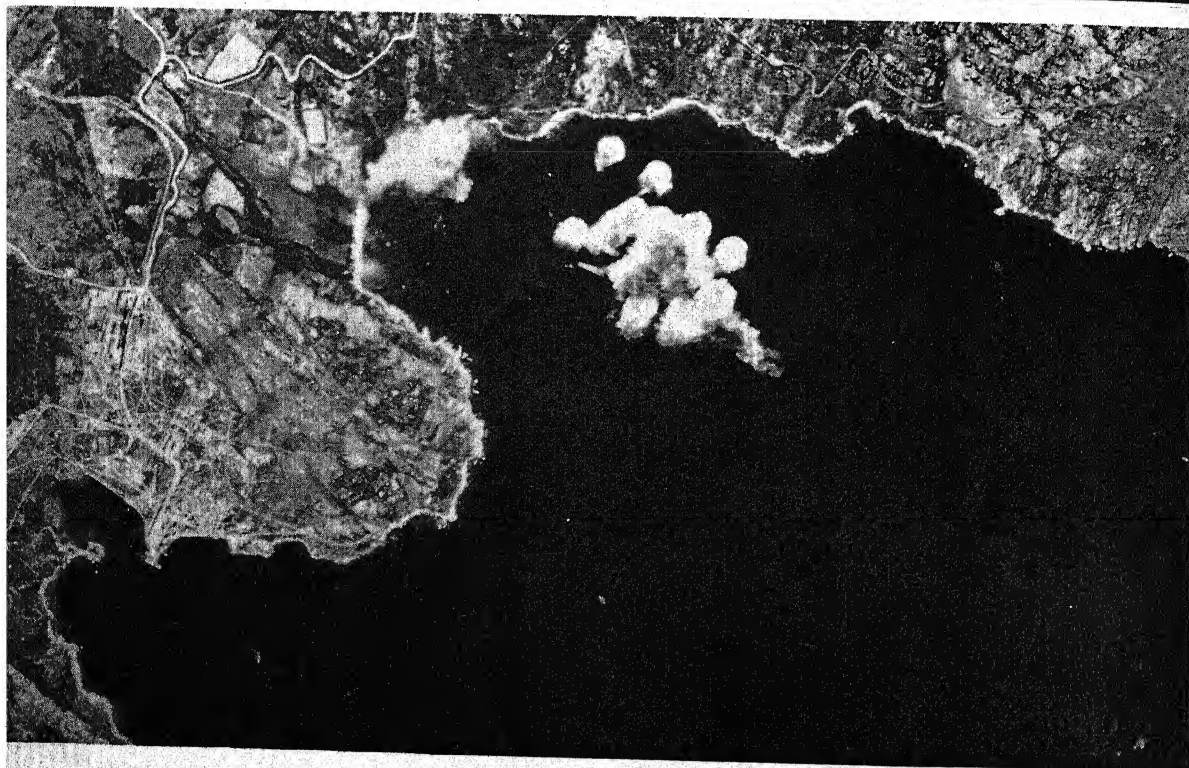
On 6 April the 376th Group moved out of Soluch to Berka 2, where the British engineers had prepared a hard-surfaced landing strip and taxi-track. A week later the group became involved in a blitz on Catania harbor, which had begun to show increased activity. The specific target was a large tanker reported by British reconnaissance. On 13 and 18 April, 10/10 cloud shielded the port. During the attack of the 15th, the 376th Group shot down an enemy aircraft and caused large fires on the southeast corner of the mole. Both the 98th and 376th attacked on the 16th and the latter went back next day reportedly to sink a merchant vessel. One of its B-24's, mortally damaged, crashed on the very edge of safety at Luca—the engineer and two gunners were the first IX Bomber Command personnel to be buried on the island. If the tanker went unscathed, Catania harbor had not.<sup>60</sup>

During April, NASAF commenced a series of vicious and very successful raids on airfields in Sicily, Italy, and Sardinia. IX Bomber Command made only one such attack, but that an effective one. The GAF used Bari as a transport base, and there also new Me-109's lined the field awaiting assignment to tactical units. To aid the 18th Army Group's offensive in Tunisia, NATAF was anxious to write off the GAF replacements. Sixty-two B-24's appeared on 26 April with 500-pounders and 20-pound frags to dismantle the hangars and destroy an estimated twenty-seven aircraft. On 28 April the 376th went to Naples for the last time until midsummer, the imminent fall of Tunisia having lowered the priority of the great harbor in comparison with Sicily and the Strait of Messina—"Ack-Ack Alley." On the same day the 98th inaugurated a long series of raids on that much-bombed neighborhood with a strike at Messina. Reggio di Calabria (where two small Italian ships were sunk on 6 May) and Augusta following, the effort soon became in name as well as in fact part of the air preparation for HUSKY.<sup>61</sup>

While IX Bomber Command worked from Bengasi against the Axis



HEAVY BOMBERS HIT AMMO SHIP, PALERMO, 22 MARCH 1943

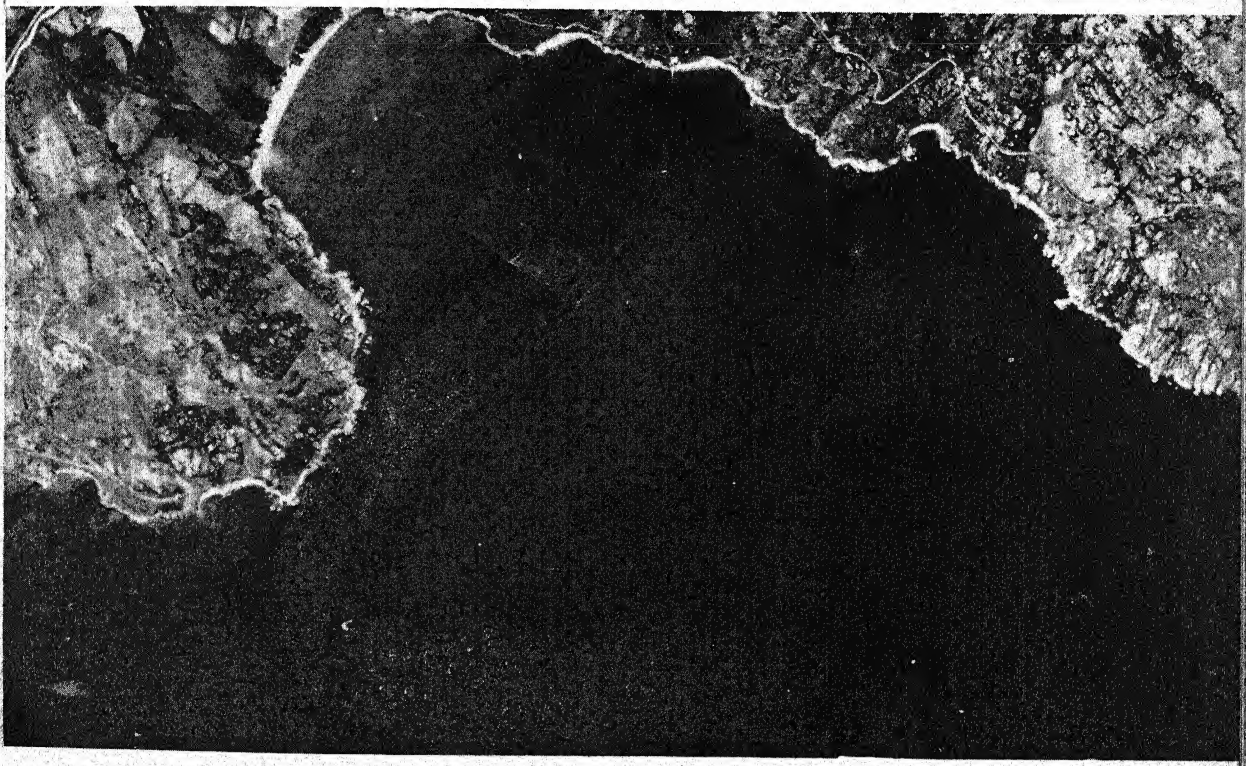


THE END OF THE

*Upper Left: 24 B-17's AT 18,750 FEET BOMB CRUISER ANCHORED IN ANTISUB NET*

*Lower Left: BOMBS HIT CRUISER*





TRIESTE, 10 APRIL 1943

*Upper Right:* CRUISER SINKS

*Lower Right:* NEXT DAY PHOTO RECONNAISSANCE SHOWS CRUISER SUNK, GIVING OFF AIR BUBBLES AND OIL SLICKS



HEAVY BOMBERS HIT AMMO SHIP OFF BIZERTE, 6 APRIL 1943

supply at the Sicilian and Italian ports, NAAF had been engaged in a desperate struggle to shut off the funnel at its western end. In mid-February the regularity of Axis reinforcement via the Sicilian strait was the gloomy counterpart of the defeats at Faid and Kasserine. The Royal Navy and the Malta RAF waged incessant war against this traffic, and during January and February the Twelfth Air Force mediums had achieved a measure of success. But since the abandonment of the expensive Libyan run and the take-over of the French merchant navy, the Axis shipping resources were suddenly in a more flourishing condition: Allied estimates of 1 February gave two million tons, including adequate tanker capacity; on that same day at Berlin it was reported to Hitler that 105 ships had arrived in Italy from France. The Tunisian garrison required some 3,000 tons daily—an amount which could be handled by 50,000 to 100,000 tons of operational shipping. Consequently, the Allies were under the necessity of developing methods to impose a strict blockade interrupting in transit the flow of materiel and manpower. The Twelfth's minimum-altitude technique, heretofore a prime weapon, had been checkmated by more generous air and naval escort for the convoys and the incorporation therein of the heavily gunned Siebel ferry.<sup>62</sup> The enemy's countermeasures, however, imposed upon him corresponding and heavy expenditures. The Italians were very short of naval escort vessels, and the umbrellas the GAF had perforce to provide cut heavily into aircraft useful elsewhere. Throughout the campaign, this defensive commitment put a continual drain on the Luftwaffe.<sup>63</sup>

For the task, NAAF had two air forces available—Strategic and Coastal—and two general types of objectives—harbors and convoys. NASAF's over-all responsibility for the destruction of Axis communications with Tunisia was emphasized in a series of March directives. Doolittle's priorities on 1 March were: first, south and westbound shipping from Sicily and Italy; second, north and eastbound shipping from Tunisia; third, aircraft and airdrome facilities; fourth, critical communications points in Tunisia. Of ship types, tankers were most attractive. The instructions were modified at least twice during the month: on the 16th, to require the use of heavies exclusively against shipping except when specific advance authority was granted by NAAF; on the 24th, to give tankers under way an even higher priority and to place active shipping in ports and the ports themselves (in that order) ahead of enemy air.<sup>64</sup>



The general spheres of Strategic and Coastal had been delineated by the mid-February reorganization, but the details remained to be worked out. Coastal, commanded by Air Vice Marshal Lloyd from Algiers, was charged with the air defense of the African coast, with protection of friendly convoys, with antisubmarine operations in the western Mediterranean, with air-sea reconnaissance, and with strikes against enemy shipping.\* Its squadrons were strung out from Agadir to Bône. Its regularly attached American units comprised the 1st and 2d Air Defense Wings, the latter with the U.S. 350th Fighter Group (P-39's) under command. During the Tunisian campaign the two wings were for the most part engaged in taking the kinks out of their air defense system, but by May the 2d Wing had been given responsibility for the more active Algiers region, in addition to the coast line west to Spanish Morocco. The P-39's were used for convoy escort, patrol, and scrambles, but they could not intercept the high-flying Axis reconnaissance.<sup>65</sup> Few of NACAF's units were within range of the Axis shipping lanes. A Fleet Air Arm Albacore squadron was based as far east as possible for short-range reconnaissance of the Bizerte approaches, and a squadron of Marauders (B-26's), relieved from torpedo bombing, provided long-range reconnaissance in Corsican and Sardinian waters as far north as Genoa, east to Naples and the Strait of Messina.<sup>66</sup>

In February most of NASAF's sweeps in the Sicilian narrows had been carried out blind—six mediums with a squadron of P-38's to deal with the air opposition which almost invariably developed, either from the convoy escort or from fighters vectored out from Tunisia or Sicily. The Royal Navy having mined the direct channel, the enemy now ran his convoys farther east towards Pantelleria, thence close inshore to Tunis, and onward. Against these more distant targets NASAF began experimenting with substitutes for the minimum-altitude attacks, which had become too costly. Reverting to medium altitude (8,000 feet) did not work—no ships were hit; and finally, Ridenour's suggestion of coordinated medium and low attacks was taken up: three three-plane elements at 8,000 and two three-plane elements on the deck, the latter attacking amid the confusion caused by the former's bombs. After the groups had been intensively trained, this method got results: on 12 March three Siebel ferries were sunk and three severely damaged out of eleven encountered.

\* See above, p. 163.

Yet this technique also had its demerits. The low flight might lag behind and lose visual contact, or not identify the target until too close to maneuver and still take advantage of surprise. Consequently, later in March the high and low flights began searching together and separating when an occasion for an attack presented. NASAF not only augmented the number of bombers with profit; it began laying on two sweeps daily. If the increased escort requirements cut heavily into the available P-38's, the necessity for heavy escort was indisputable.<sup>67</sup>

In March, NACAF's Marauder reconnaissance began to provide information on Africa-bound convoys in the Tyrrhenian Sea, so paving the way for NASAF to lay on timed strikes in the Sicilian narrows. On 16 March, accordingly, Spaatz directed Doolittle to hold two medium squadrons for missions to be assigned by NACAF; and on the 24th a NAAF order forbade the employment of the squadrons in question on other than NACAF authority. Coastal shared with the Royal Navy an operations room at the St. George Hotel in Algiers where the location of all friendly and enemy shipping and submarines was constantly plotted. Here the Marauders' report was filed, and if the target was suitable the NASAF mediums would be ordered against it. This system chafed NASAF in that no provision existed for releasing the bombers and their escort. Other bomber commitments were suffering from the shortage of P-38's. Besides, NASAF had access to other information—from its own P-38 reconnaissance and from reports derived from Malta via NATAF and 18th Army Group—which disclosed profitable targets. These considerations being set forth at a conference on the 25th, Lloyd agreed generally to release the antishipping force if a target had not been assigned by 2000 hours the previous night; on extreme occasions NACAF might hold it until midnight. This understanding governed the two commands through the remainder of the campaign.<sup>68</sup>

On special occasions the B-17's also were employed against convoys at sea, with excellent results reported. The first such attack took place off the Lipari Islands, north of Sicily, on 26 February, when twenty B-17's bombed a twenty-one-vessel convoy from 15,000 feet, claimed to have sunk one ship, and fired three. In March the B-17's made five attacks in less remote waters. On the 4th, fifteen B-17's claimed to have sunk four out of six unspecified craft northwest of Bizerte. Two other strikes drew blood, one made no sighting, and the last was foiled by a vicious fighter attack just before the bomb run. The B-17 claims permitted the calculation that under favorable conditions eighteen heavies

would normally sink two vessels out of a convoy; but the claims have not been confirmed thus far on the enemy side. NAAF's own estimate of its score against enemy ships in the first month of its existence ran to twenty destroyed, fifteen badly damaged, and eleven damaged, these categories being austere defined.<sup>69</sup>

Nevertheless, because of considerations of time and space, convoys did not constitute the normal targets for B-17's. The problem was this: it took two hours to dispatch the heavies once instructions were issued, a half-hour for take-off and rendezvous, an hour and a half to the strait; and in these four hours the convoys could reach heavily defended areas. The ports, on the other hand, always contained worthwhile targets. Until mid-February the B-17's had attacked exclusively ports of off-loading, but presently they began visiting Sicily and Sardinia: Palermo on the 15th, Cagliari on the 26th and 28th of February. Not until the end of March did it seem necessary to revisit Cagliari, at which time two M/V's were fired, four other ships hit, the adjoining railroad station and seaplane base wrecked, and nearly half the berths rendered unusable.<sup>70</sup> Enemy records show that the Italians lost three ships, aggregating 10,000 GRT, at Cagliari on the 31st.

On 22 March, twenty-four B-17's of the 301st Bombardment Group achieved what Spaatz considered to be the most devastating single raid thus far in the war by causing an explosion at Palermo (felt at their altitude of 24,000 feet) which blew up thirty acres of dock area, sank four M/V's, and lifted two coasters onto a damaged pier—the Italians wrote off six ships totaling 10,000 GRT. Tunisian ports still engaged, however, a major part of the heavies' attention. Bizerte, the busiest, was the particular care of the Wellingtons, but on 25 February and again on 23 March the B-17's attacked. The continued flak build-up was making accurate bombing increasingly difficult. During the February mission, one of the first bursts hit the leading B-17 in the region of the bomb bay; an oxygen bottle exploded, and when the leader jettisoned his bombs, several other aircraft dropped with him. Wide of the target, some of these bombs apparently hit a submarine in Lake Bizerte. Ferryville was badly damaged on 24 March. In addition to a tug and a minesweeper, the B-17's sank two M/V's; one, the *Città di Savona*, unloading ammunition, exploded. La Goulette, Tunis, and Sousse all were attacked in March. When the Eighth Army entered the last named in April, its harbor resembled nothing so much as a nautical junkyard.<sup>71</sup>

Extensive use of air transport had long been an Axis reliance in the

African war, in Egypt and Libya as well as in Tunisia. Ju-52's had brought the first Germans to Tunisia, back in November; and the service from Sicily and Italy had thereafter flourished—twenty to fifty daily back and forth by the end of 1942, about a hundred landings daily at Tunis alone by mid-March. In the first few days of April, Tunisian landings rose to 150. The Army had long since concluded that the enemy forces could not be maintained without the Ju-52's.<sup>72</sup>

Late in March the enemy was using approximately 500 air transports (Ju-52's, SM-82's, Me-323's) based principally at airdromes in the Naples and Palermo areas, with some at Bari and Reggio di Calabria. Generally, the flights originated at Naples and proceeded via staging airdromes in Sicily across the strait to Tunisia, where the main terminals were Sidi Ahmed and El Aouina. Morning and afternoon missions were common, weather permitting. Direct flights out of Naples to Africa rendezvoused with escort over Trapani—about twelve fighters being usually assigned.<sup>73</sup>

This traffic had long been greedily eyed by the Allied air; and as early as 5 February the Eastern Air Command had developed plans for 242 Group. Expanded to include XII Bomber Command, the operation—coded FLAX—was ready to go when the Kasserine crisis intervened. Allied Air Force canceled it on 19 February.<sup>74</sup> Thereafter the plan underwent progressive revisions and eventually became NASAF's responsibility. The movement was watched by radar and photo reconnaissance, and a mass of detailed information from all sources was collected and kept up to date, nothing being done, meanwhile, to flush the game. Fundamentally, the plan involved P-38 sweeps over the Sicilian strait synchronized with an escorted shipping sweep, while other bombers and fighters struck at the departure and terminal airdromes.

Early in April the moment seemed ripe: the traffic heavy enough to permit crippling losses, the campaign in a stage when the losses could be least afforded and hardly made up. April 5 provided the right weather and FLAX was laid on.<sup>75</sup>

At approximately 0800, twenty-six P-38's on patrol over the strait intercepted a mixed formation of fifty to seventy Ju-52's, twenty Me-109's, six Ju-87's, four FW-190's, and one FW-187, some apparently escorting a convoy of a dozen M/V's. The action took place a few miles northeast of Cap Bon and resulted in two missing P-38's and claims of eleven Ju-52's, two Me-109's, two Ju-87's, and the FW-187 shot down. At about the same time, a B-25 sea sweep hit two Siebel

ferries and blew up a convoying destroyer while the escort—from the 82d Group—reportedly knocked down fifteen aircraft out of the cover. The terminal fields were next attacked, Spitfire-escorted B-17's hitting Sidi Ahmed and El Aouina with frags. By noon the Sicilian airdromes could be expected to have received arrivals for the second daily flight to Tunisia, and other B-17's accordingly visited Boccadifalco and Trapani/Milo airdromes while B-25's went to Borizzo. The last attack was strenuously opposed—two B-25's were ditched near the Egadi Islands—but bombers and escort claimed six Me-109's. The frag bombing in Sicily was excellent and the target aircraft were not too well dispersed. The blow evidently disrupted the shuttle service, for P-38's on patrol in the afternoon reported the strait clear of transports. After carefully studying the photographs, NAAF concluded that 201 enemy aircraft had been destroyed, all but 40 on the ground, as against 3 friendly aircraft lost and 6 missing. At any rate, after the raids the Germans could muster only 29 flyable Ju-52's.<sup>76</sup> The Luftwaffe admitted to 14 Ju-52's shot down, 11 transports (Me-323's and Ju-52's) destroyed on the ground, and 67 transports damaged. That Axis bomber and fighter losses to FLAX might have been proportionately high is suggested by the GAF complaint that its Sicilian fields were overcrowded and, where situated on the coast, unprotected by forward AA.<sup>77</sup>

Smaller editions of FLAX were put forth in succeeding days. On 10 April a P-38 sweep with a flight on the deck and one at 1,000 feet caught the shuttle coming into Tunis: the low flight claimed twenty transports and the upper eight fighters out of the escort of Me-109's and Mc-200's. Later that morning an escorted B-25 shipping sweep reportedly knocked down twenty-five aircraft, twenty-one of them transports, most of which burst into flames and exploded. Next day two P-38 sweeps added twenty-six Ju-52's and five escorts to the mounting score.<sup>78</sup>

Western Desert Air Force gave the *coup de grâce* to the Axis transport system. Around 12 April, when the enemy had retreated to the Enfidaville line and his situation was becoming progressively more desperate, he brought in replacements from other theaters and resumed his two convoys a day with even heavier escort. WDAF, by then based in the Sousse area and operating seaward-looking radar, was advantageously placed to interrupt sea and air transport in the region of Cap Bon. It assigned a high priority to the renewed traffic. Operating from

El Djem, the 57th Group began its sweeps over Cap Bon on 17 April. On 18 April occurred the famous Palm Sunday massacre.<sup>79</sup>

At about 1500 hours the Germans successfully ran a large aerial convoy into Tunisia, probably to El Aouina or La Marsa. On its way back, flying at sea level (one of the Americans described it as resembling a huge gaggle of geese) with an ample escort upstairs, the formation encountered four P-40 squadrons (57th Group, plus 314th Squadron of the 324th Group) with a top cover of Spitfires. When the affair ended, 50 to 70—the estimates varied—out of approximately 100 Ju-52's had been destroyed, together with 16 Mc-202's, Me-109's, and Me-110's out of the escort. Allied losses were 6 P-40's and a Spit. The Germans, who admitted to losses of 51 Ju-52's, worked intensively on the transports which had force-landed near El Haouaria, and several of them later took off for Tunis despite Allied strafing. Next day the bag was duplicated on a smaller scale when 12 out of a well-escorted convoy of 20 Ju-52's were shot down.<sup>80</sup>

Despite his staggering losses the enemy persevered. Supply by sea, harried both by air and naval attacks, was not sufficient to sustain the bridgehead, now fighting for its life. The rate of aircraft landings achieved early in April would have transported a full third of the enemy's requirements in the last half of the month. Fuel was particularly short and a decision was apparently taken to throw in the big Me-323's boasting four times the capacity of the Ju-52's. This endeavor came to an untimely end on 22 April when an entire Me-323 convoy was destroyed over the Gulf of Tunis by two and a half Spitfire squadrons and four squadrons of SAAF Kittyhawks. Twenty-one Me-323's were shot down, many in flames, as well as ten fighters, for the loss of four Kittyhawks. With Allied fighters, as he put it, "in front" of the African coast, Maj. Gen. Ulrich Buchholz, the *Lufttransportfuehrer Mittelmeer*, gave up daylight transport operations, although he continued for a time with crews able to fly blind to send in limited amounts of emergency supplies by night. He also developed an alternate route via Cagliari. Journeying from staging fields in Sardinia in the predawn, to avoid the fatal Cap Bon area, the Ju-52's sometimes fell in with Beau-fighters which NACAF vectored out from Bône.<sup>81</sup>

The disruption of the Axis air transport system was hastened also by effective, if less spectacular, bomber action at widely separated airfields. Except for the strike at Bari, NASAF carried on the whole of the campaign. The opener was the B-17 attack on Capodichino, outside Naples,

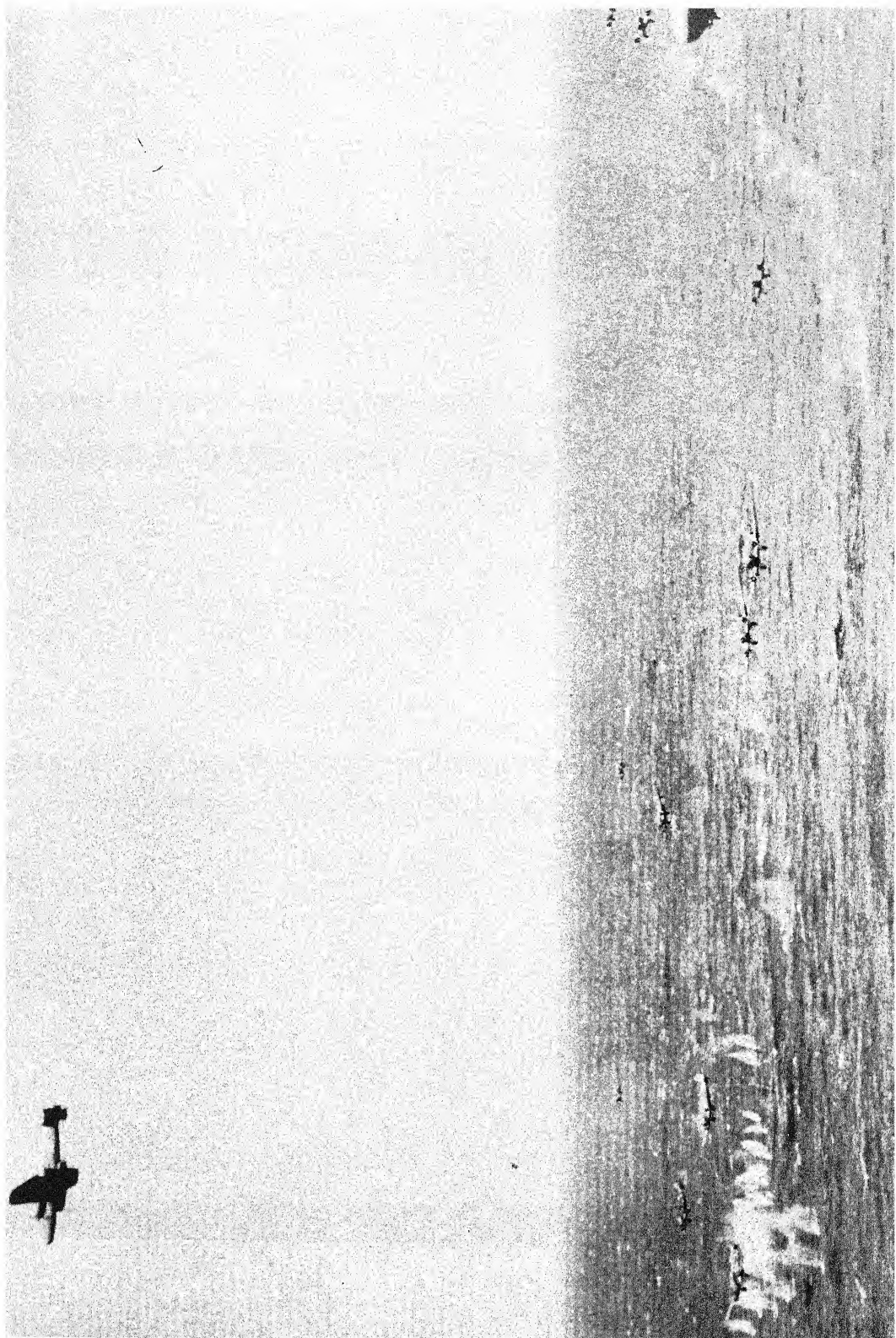


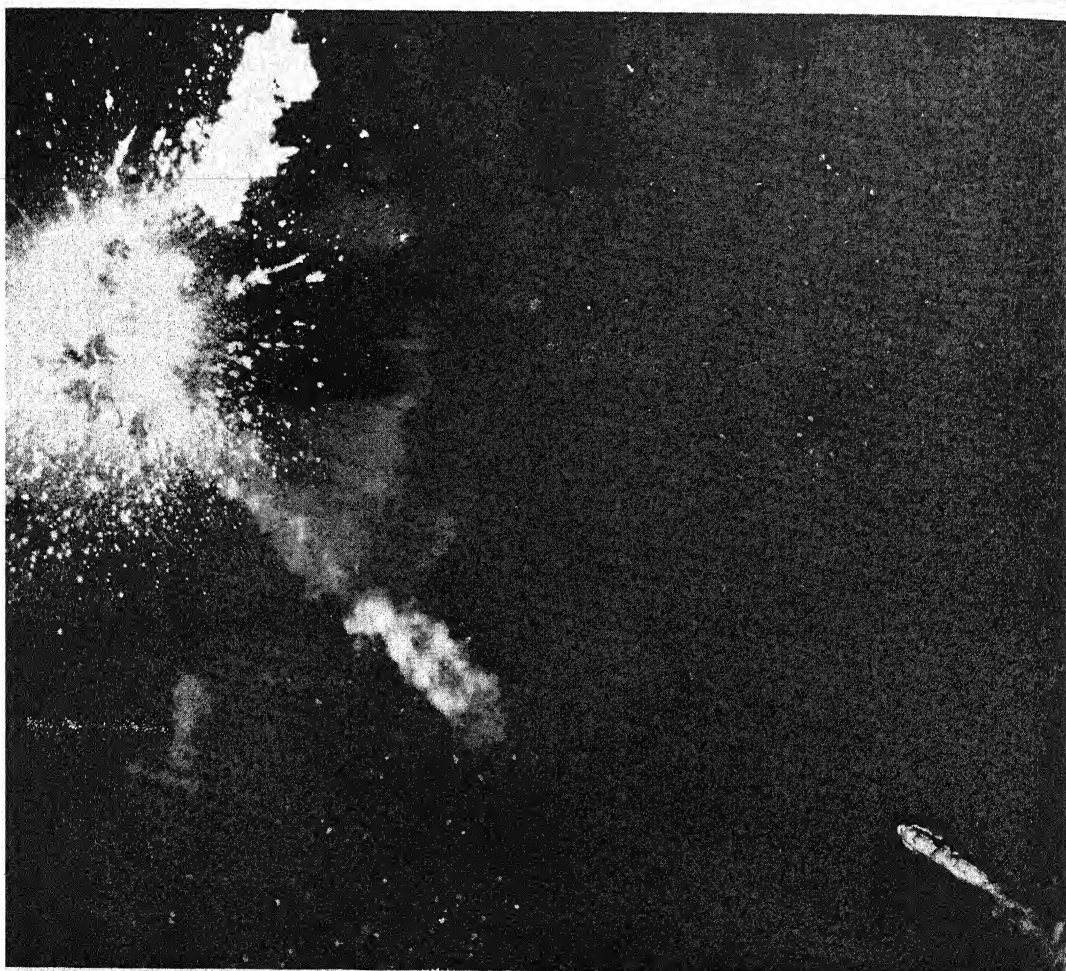
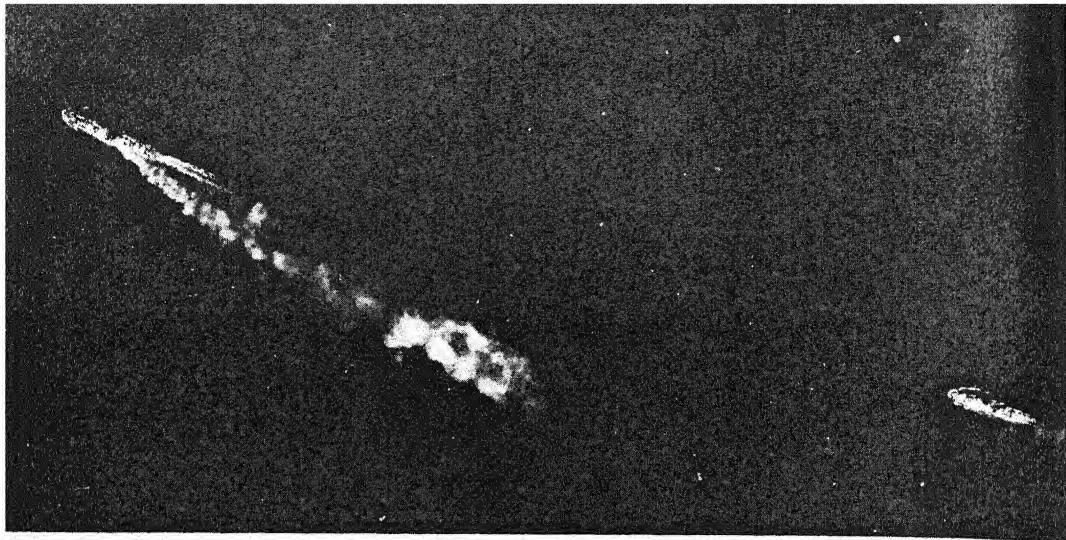
undertaken the day before the big FLAX effort and in which half of the fifty aircraft seen on the ground were assessed\* as destroyed or damaged. During the week of 10-16 April, Castelvetro and Milo in Sicily and Decimomannu, Monserrato, Elmas, and Villacidro in Sardinia were given the frag treatment, the attack on Castelvetro on 13 April being particularly fruitful: forty-four aircraft hit, including three Me-323's. In the third week in April, B-17's and B-25's struck at Boccadifalco (Sicily) and Alghero (Sardinia); and towards the end of the month Grosseto (Italy) and Villacidro came under B-17 attack, while Wellingtons dropped on Decimomannu. Besides destroying Axis transports, these missions wrote off fighter and antishipping aircraft as well.<sup>82</sup>

After the long months of foul weather and of shortages in P-38 and medium groups, April of 1943 found NASAF flexing its muscles. Reinforcements had arrived. A new group of B-25's (the 321st) had gone into action in the latter half of March, and in April the 320th (B-26's) began operations. The replacement situation, which had been so bad with the mediums that groups had dwindled to twelve crews and morale had been extremely low, had undergone improvement.<sup>83</sup> The escort fighters, viewed high<sup>84</sup> and low in NASAF as the bombers' best friends, were now comparatively abundant. The 325th Group (P-40's) had been transferred from NATAF and the rejuvenated 14th (P-38's) was back from rest and refitting.<sup>85</sup> Moreover, two new heavy groups had come into the theater, the 99th and the 2d, both beginning operations in April.<sup>86</sup> (The 99th broke in nicely with extremely accurate bombing on two of its first missions.<sup>87</sup>) The assignment of these units to NASAF came as part of a reshuffling of heavy groups among the United Kingdom, North Africa, and the Middle East.<sup>88</sup>

So strengthened and with tactics and jurisdictions fairly firm, NASAF carried on its share of the isolation of the bridgehead with increasing success. Its mediums continued to scour the Sicilian narrows, employing the coordinated medium- and low-level attack, for the latter proved by far the most effective. The B-25's developed another variation of this technique by which high and low elements flew together at less than 100 feet until the target was sighted. Bombed-up P-38's began to be used again (they had been tried on antishipping work in December). After a fruitless mission on the 23d, on 26 April a formation of

\* Photo interpretation does not provide a complete estimate of damage inflicted on aircraft by frag bombs.





B-17 ANTISHIPPING STRIKE OFF BIZERTE

P-38's, operating independently, scored against an escorted convoy of Siebel ferries. When escorting mediums, four or five P-38's would carry bombs.<sup>89</sup>

B-25's blew up a destroyer on 5 April; many vessels were left in flames in the days from 4 to 16 April when the weather was good; and on the 15th, P-38's blew up a large barge. During the last week in April, enemy shipping to Tunisia increased sharply because of the urgent need for supplies and the infeasibility of air transport. Although bad weather favored the movement, NAAF antishipping forces put forth maximum effort to interrupt it. P-38's and B-25's performed well in the last three days of April, but the most successful of the attacks that week were credited to WDAF's P-40's and Kittybombers.<sup>90</sup>

The very heavy formations of fighters which WDAF put over the Cap Bon approaches on the lookout for Ju-52's and Me-323's provided almost continuous reconnaissance and very little shipping escaped notice. The fighter-bomber force kept in readiness at the airdromes was often called upon. Accustomed to field targets, the fighters at first achieved no very spectacular results, but they improved with practice. On the 30th of April alone, WDAF fighter-bombers sank an escort vessel, a 1,000-ton M/V, a Siebel ferry, an E-boat, and an F-boat. That same day, P-40's and Kittybombers scored a direct hit on a German destroyer off Cap Bon. The DD zigzagged desperately before it took a bomb amidships which shook the planes above with the resulting explosion. The commander landed his dead and wounded near Sidi Daoud and complained that it was no longer possible to sail in the daytime. Sailing was little if any better at night, for the Royal Navy maintained dark-to-dawn destroyer and motor torpedo-boat patrol.<sup>91</sup>

The heavy volume of shipping to Tunisian ports in the first week of May was protected by four days of bad weather. On the 6th, WDAF's fighters blasted two destroyers headed northeast off La Goulette: one exploded; the other, although on fire, succeeded in making off.<sup>92</sup> The vigor of the air blockade is evident from the career of an Axis prison ship which loaded on 4 May at Tunis and anchored for three days off Cap Bon before the Germans abandoned her. She was strafed by at least forty P-40's and Kittyhawks, had 100 bombs aimed at her (only one, a dud, hit). Luckily, the fighters had not perfected their art: only one P/W was killed.<sup>93</sup> The increase in Axis shipping traced largely to the influx of Siebel ferries and tank landing craft (F-boats).

The B-17's scored impressive successes against ships at sea on the few



occasions when they went out after such targets—four times during April and early May. On the afternoon of 23 April, the heavies hit a ship twenty miles west of Sicily, which patrols out of Malta reported sank around midnight (it may also have been torpedoed by Malta Beauforts). On 6 April a munitions ship disintegrated under direct hits; and on 5 May another was heavily damaged off the northwestern tip of Sicily. The most celebrated of the heavies' current exploits, however, occurred at the La Maddalena naval base in northern Sardinia.

At the beginning of April, the reduced Italian navy still contained three heavy cruisers, of which one, the *Bolzano*, was laid up for repairs at La Spezia. NAPRW spotted the *Trieste* and *Gorizia* at La Maddalena anchored in coves and inclosed in antisubmarine nets. A German admiral had recently taken command of the Italian fleet, which event could be interpreted as foreshadowing for it a more aggressive role; at any rate, there seemed no harm in laying up the rest of the Italian heavy cruiser force. NAPRW worked overtime duplicating the photographs, and Spaatz ordered an attack on the first occasion when priority shipping could not be discovered in Tunisian ports or en route thereto. On 10 April the B-17's pitted 1,000-pound bombs (1/10-second nose fuze and 25-thousandth in tail) against 2- to 3-inch deck armor. Twenty-four B-17's sank the *Trieste* from 19,000 feet. Thirty-six B-17's attacked and badly damaged the *Gorizia*. The remaining twenty-four bombers dropped on the harbor and submarine base. Although further damaged by a P-38 attack on 13 April, the *Gorizia* got away to join the *Bolzano* at Spezia, where the RAF Bomber Command promptly laid on a night attack.<sup>94</sup>

The brilliance of these attacks could not but confirm the American airmen's faith that their long-time emphasis on high-altitude daylight bombing had been correct. Spaatz recorded in May that the day-to-day operational premise at NAAF was that any target could be neutralized—"even blown to oblivion"—by high-altitude onslaught. Even well-dispersed aircraft—once thought unremunerative bomber targets—were far from immune to B-17's and their cargoes of frag clusters. Losses in TORCH had been slight. As of 22 May, over a week after the Tunisian finale, only twenty-four B-17's had been lost in combat; and of these only eight were known victims of enemy fighters (the others were charged off to flak or to causes unknown). The signal failure of the GAF to fathom the B-17 defense, of course, could not be counted upon indefinitely. All of which caused Spaatz to regret that the turn of

the wheel had not allowed the inception in 1942 of a decisive bomber offensive against Germany.<sup>95</sup>

Ports still remaining the prime target of the B-17's, the bombers worked at them with a vigor and intensity commensurate with their greater numbers and the improving weather. The old milk-runs to Tunis and Bizerte continued, although the importance of these harbors had somewhat diminished with progressive damage to their facilities and the tendency of E- and F-boats to discharge on the beaches of the Gulf of Tunis. Even merchantmen were observed being unloaded by lighters from offshore anchorages. At one point early in April the lack of significant shipping in Lake Bizerte gave rise to hopes that the enemy was concentrating on keeping Tunis operational; but, the event proving otherwise, attacks were laid on Bizerte and Ferryville on several occasions in April and May and only prevented on other occasions by bad weather. Ferryville took a fearful pounding from the B-17's on 7 April. The most effective attacks against Tunis and La Goulette occurred on 5 May when extensive damage accrued to port installations and eight small craft were sunk by the bombs.

On 4 April the B-17's first paid their respects to Naples, ninety-one of them dropping on the port, the airdrome, and the marshalling yards. But the ports of western Sicily and, to a lesser extent, those of southern Sardinia felt the heaviest weight of attack as the battle of Tunisia drew to a close; in the last weeks NAAF was interested in destroying the facilities which might be used for an evacuation from Tunisia. Three B-17 missions against Palermo, on 16, 17, and 18 April, evidently partially disabled the port: no major shipping was observed there for the rest of the month. Among other damage, the seaplane base was dismantled and a 190-foot gap blown in one of the quays. On 9 May, B-17's, B-26's, and B-25's came back in a bitterly contested attack in which 211 bomber sorties were flown and 17 interceptors were claimed as destroyed. A goodly number of explosions was noted. The Axis flak proved unusually accurate and intense, shooting down one B-17 and damaging no less than fifty others. Wellingtons followed up with a night raid.

Very heavy attacks, in which the mediums participated and which the Wellingtons followed up, were also thrown at Marsala and Cagliari. The combined action of 13 May completed the neutralization of the latter on the same day that the last Axis commander was formally tendering his unconditional surrender in Tunisia. At that point the total



motor transport and Diesel fuel left in the former bridgehead amounted to forty tons.<sup>96</sup>

### *Liquidation of the Bridgehead*

In mid-April the enemy defended a restricted, hill-girt bridgehead, bounded generally by Enfidaville, Pont-du-Fahs, Medjez-el-Bab, and Sedjenane, beyond which the Allies were taking position for a final assault. In the east, the Eighth Army was facing up to the Enfidaville line; on its left the French XIX Corps was operating in the area of Pont-du-Fahs; in the center, the sector between the French and 5 Corps at Medjez had been allocated to the British 9 Corps. At the northern extremity, 5 Corps units awaited relief by the American II Corps, which, pinched out by the Eighth Army's drive from Akarit, was swinging north across the whole line of communications of the First Army. Soon to pass to Maj. Gen. Omar N. Bradley, II Corps (1st, 9th, 34th Infantry Divisions and 1st Armored) began taking over north of Béja on 12 April; twenty miles of rugged terrain lay between it and the flatlands around the key communications center of Mateur.<sup>97</sup>

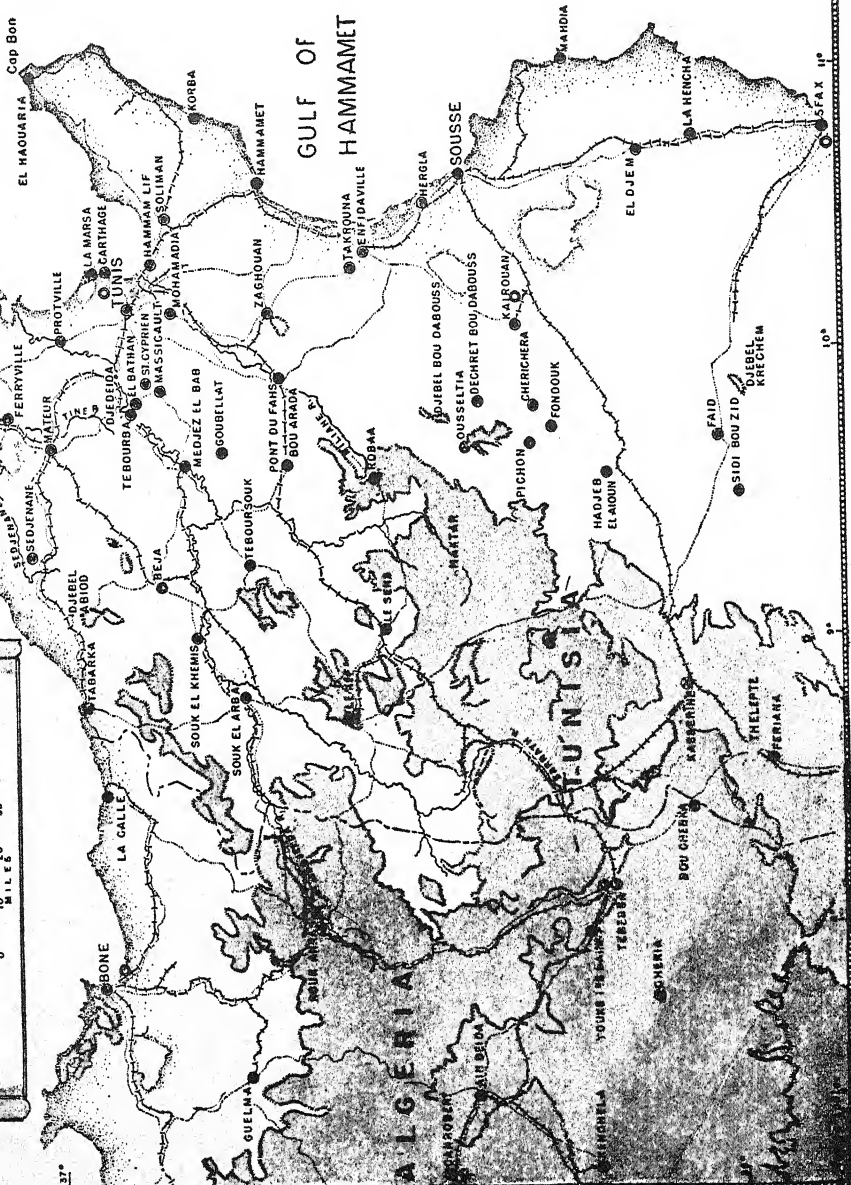
The 5 Corps had prepared Bradley's way by an offensive which began on 7 April with the object of clearing the Medjez-Béja road. Hard fighting in mountainous country brought the desired results, although the abominable terrain and the appearance of the best of the available enemy reserves limited the territory won. By the 15th, the British having reached Djebel Ang, the front was largely stabilized and a few days of comparative quiet ensued.<sup>98</sup>

Whatever the difficulties of the country around Medjez and Béja, it was better suited than the eastern sector for a decisive blow. The mountains running from Zaghuan into the Cap Bon peninsula sealed off Tunis against an attack from the Allied right: they allowed little scope for armor and could be penetrated only at considerable cost. The brunt of the campaign now passed to Anderson's First Army, with 5, 9, and XIX Corps under command, the Eighth Army's role consisting in exerting maximum pressure to pin down as many of the enemy as possible. On 11 April, Alexander ordered Montgomery to send an armored division and an armored car regiment to reinforce First Army.<sup>99</sup>

The Eighth Army's first try at the Enfidaville position did nothing to dispel the impression that it was not a suitable avenue to Tunis. The attack jumped off the night of 19/20 April. Enfidaville village fell and

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patrols pushed out into the flat country beyond; but Takrouna Hill, so steep that the defenders had resorted to rope ladders to scale it, occupied the New Zealanders two days. Montgomery withstood a number of counterattacks, regrouped for a thrust along the coast, and then decided that the game was not worth the candle.<sup>100</sup> The Eighth Army had moved without the customary preparation by WDAF, save for reconnaissance and a few fighter-bomber sorties. The enemy positions were well hidden; no vehicle concentrations appeared; besides, low clouds overhung the area. A number of fighter-bomber strikes, however, were laid on the stubborn Italians on Djebel Garci. Altogether (this was the time of the Palm Sunday massacre), the contemporary operations against air and sea traffic paid off better.<sup>101</sup>

The Ninth Air Force units operating with WDAF were by now all on the maritime plain. The 57th, which had been running patrols over minesweepers around Zarzis and over convoys between Djerba and Sfax, moved into El Djem North and later, on 21 April, into Hani Main, six miles east of Kairouan. Except for a rear echelon, the 12th Group was by 17 April at El Maou, outside Sfax, near neighbor to a newly arrived U.S. medium group, the 340th, which was to begin independent operations two days later with a raid against the Korba landing ground on Cap Bon. The 79th jumped to Hani West on the 18th; previously it had been flying escort from La Fauconnerie for minesweepers moving into Sfax and Sousse.<sup>102</sup>

Alexander issued his order on 16 April, and three days later Anderson, who had the operation immediately in charge, laid down First Army Instruction 37 for VULCAN. For the main blow, 5 Corps would strike along the axis Medjez-Tunis: first objective, the high ground at Peters Corner and Longstop (Djebel Ahmera); second, the high ground near Massicault and El Bathan. The 9 Corps was to move against the highlands west of the Sebkret el Kourzia, with the idea of destroying the enemy armored reserve and of getting behind the defenders opposite 5 Corps. Bradley's main attack was to be delivered just north of 5 Corps along the Béja-Oued Tine-Chouigui axis; this meant an excursion into the dominating hills, for the narrow Oued Tine valley offered facilities for mousetrapping the American armor. The reopening of the Robaa-Pont-du-Fahs road constituted XIX Corps' chief objective. D-day was set for 22 April; 9 Corps would be attacking in the morning, 5 Corps after dark, II Corps the succeeding night, and XIX Corps when ordered by Anderson.<sup>103</sup>

NATAF's undertaking towards the enemy in Tunisia was fourfold. It would endeavor to destroy his air force; disrupt his supply lines, sea and air; furnish air strikes in the battle area; and prevent his bringing off a "Dunkirk." Except for the battle-area strikes, NACAF and NASAF shared in these functions. Once the enemy had abandoned the maritime plain for his shallow bridgehead, no part of which was beyond the reach of very heavy air attack, his position had become patently hopeless;<sup>104</sup> and the only sensible course was evacuation. The Allies had perforce to make elaborate plans to deal with an exodus, the Royal Navy, NATAF, NASAF, RAF Malta, and IX Bomber Command all carving out spheres in which they could employ their energies to prevent any sizable number of Tunisian veterans from fighting again in Europe or the Mediterranean isles. Doolittle wrote, in language reminiscent of Churchill's on a less auspicious occasion: "We plan to strike them on land, in the concentration area in their harbors where the larger boats will come, along the coast where smaller craft will load, and at sea." In order to prevent Pantelleria from sending planes to cover an evacuation, its airfield was marked as a priority target<sup>105</sup> and a series of attacks carried out from 8 to 11 May. On the first day of the exercise 120 B-25's and other WDAF light bombers and 13 bombed-up P-38's put the landing ground out of action, destroyed a sizable number of aircraft, and damaged the doors at one of the two entrances to the underground hangar. The remaining attacks were mainly precautionary.<sup>106</sup> In the event, no mass evacuation was attempted because it was not possible. As Field Marshal Keitel confirmed in 1945, the Axis had in Tunisia the choice only of resistance or surrender.<sup>107</sup>

The fact that the enemy could not move out of fighter range of 242 Group at Souk-el-Khemis, XII Air Support Command at Le Sers, and WDAF in the Kairouan-El Djem-Hergla region (TBF was alongside 242 Group) made necessary close control of the Allied air effort. The area being too small for three fighter controls and too large for one, XII ASC passed under 242 Group's operational control for all offensive action. This was logical enough since the First Army was the main ground force control. XII ASC, however, retained its own fighter control for defense of its landing grounds. No. 211 Group operated WDAF's fighter control. Moreover, further to prevent overlapping, general areas of responsibility were delineated. WDAF was to cover the Cap Bon peninsula south to the bomb line and west to the Miliane River. Beyond the Miliane, XII ASC action was to be localized, so far

as possible, to the south of the area covered by 242 Group.<sup>108</sup> XII ASC had expected to continue its association with II Corps, but upon the latter's move northward it was found impracticable in the limited time available to reshuffle airdromes between XII ASC and 242 Group. So XII ASC provided assistance to British and French units on its immediate front. In the event, subordination of XII ASC to 242 Group proved unsatisfactory in one respect. Land line communications between Souk-el-Khemis and Le Sers—thirty-five miles to the south—were unreliable, and in the rapidly changing situation towards the end of the campaign, a large part of XII ASC's potential went unused.<sup>109</sup>

D-day for the ground forces was 22 April. In accordance with Coningham's order,<sup>110</sup> NATAF began its intensive program on the night of the 18th. Phase 1 was familiar: airfields to be bombed night and day to keep the enemy fighters on the defensive, very heavy escort accompanying, including a large proportion of fighters which would operate in a free role. LEO-45's, Wellingtons, and TBF Bisleys led off with strikes at the Sebala landing grounds north of Tunis, the force dropping delayed-action bombs while night-flying Hurricanes waited for any fighters that might come up. Next morning, on the 19th, A-20's and B-26's took up the attack on the Sebalas, and on the 20th, NASAF and NATAF flew more than 1,000 counter-air sorties in support of the Eighth Army's offensive on that day. Attacks on La Marsa and Sidi Ahmed having begun the night before, twenty-three Spitfire-escorted B-17's appeared over each of these heavily defended airdromes. Altogether, sixteen fields were punished on the 20th, four B-25 missions being flown against the area between Tunis and Bizerte which, especially around Protville, had sprouted numerous new landing grounds as the enemy sought to hide and disperse his dwindling force. On this region TBF also concentrated its effort. A-20's with close and free-lance escort maintained a shuttle service throughout the day. The escorting Spits kept bomber losses to two, neither apparently due to enemy action. Meanwhile, since 10 April, WDAF had been making the Cap Bon landing grounds its nightly concern.

Although the results were looked on as generally good, the number of targets, the difficulty in locating and identifying them, and the enemy's extraordinary dispersal limited the material effects of the bombardment. The GAF was using over twenty-five landing grounds west of Tunis alone, and its fighters, like hunted rats, were seldom to be found in the same place twice running. Aircraft were often dispersed

in pens as much as 1,000 yards from the strip. The degree of dispersal and mobility achieved by the GAF doubtless saved it from annihilation; but it was plainly no way to operate an air force.

A rainstorm on the night of the 20th obstructed the counter-air program, but the ferocity of the attacks apparently demonstrated to the GAF that Tunisia-based planes were a wasting asset. By the 20th, Me-109's and FW-190's were seeking the comparative safety of Sicily. Not all departed, for on 7 May an estimated 200 aircraft still cleaved to the bridgehead. But when the ground forces went forward on 22 April, the first part of NAAF's program was complete: local air superiority had been achieved. Thenceforth, a light scale of attack by FW-190's, which had replaced the Stukas, and special operations laid on with Sicily-based night bombers constituted the GAF's contribution to the defense. TBF's escort dwindled until no more than two fighters went along with the bombers. In essence, the Allied air forces were free to cooperate with the ground arm.<sup>111</sup>

Sensing the impending blow, on the night of the 20th the Germans threw in a spoiling attack between Medjez-el-Bab and Goubellat; but it lost them something over thirty tanks and scarcely delayed the Allied push. The 9 Corps struck north of Bou Arada. During three days of heavy infantry fighting two British armored divisions passed through and engaged enemy tanks. By 25 April, 9 Corps had won territory enough to compel an enemy withdrawal on the left of XIX Corps sector; the French thereupon advanced eighteen miles before being brought up short in the foothills north of the Pont-du-Fahs-Enfidaville road. Through the 26th, the 1 and 6 Armoured had been able to knock out much of the hostile armor, but the enemy shortly withdrew his tanks and resorted to mine fields and antitank screens. Anderson consequently discontinued the attack and ordered two divisions back to army reserve. Jumping off almost on schedule on the 22d, 5 Corps bit into the enemy defenses at the head of the Medjerda valley. Hammering artillery and heavy air attacks did little to ease the infantry at such celebrated fortresses as Djebel bou Aoukaz and Djebel Ahmera, but by the end of April, Anderson had got elbow room for his armor east of Medjez. Moreover, the enemy seemed about ripe for the breakthrough.<sup>112</sup>

In the northern sector II Corps had moved out on 23 April to begin a series of flanking operations against the jumbled and apparently interminable hills covering the Mateur approaches. With the Corps Franc



d'Afrique on its left, it threw the weight of its attack at the Oued Tine area, adjacent to the main Allied effort east of Medjez. The drive was so successful that by 1 May the opposition was barely hanging onto the hills protecting the flat land around Mateur. That night a general withdrawal ensued all along the line; Mateur was given up and a new defense hastily organized on the Bizerte approaches and in the last hills screening the Tunis plain.<sup>113</sup>

The air attacks on 22 April centered in the 5 Corps sector where Longstop, Ksar Tyr, Crich el Oued, and Ain el Asker suffered from the attention of Bostons and A-20's. B-25's bombed a suspected headquarters northeast of Pont-du-Fahs, and a number of other attacks were made in that general region. Numerous fighter-bomber sorties were laid on and an extensive schedule of sweeps carried out over the entire battle area. On the 23d the program was extended to the II Corps sector. Attacks occurred on the Mateur railroad yards and on the Béja-Mateur road, while close "support" continued in the Medjez sector with Ksar Tyr receiving particular attention. Weather confined the program on the 24th to the efforts of the fighters. Throughout these operations, most of the bombing had been on pinpoints in broken country, and in the circumstances was very accurate. II Corps area, especially, did not lend itself to air action by either side, and the Allied attacks fell mostly on the Mateur nodal point. A minor rainy season seriously reduced the tactical bombing effort on the 29th and 30th.

If, because of the nature of the battleground, the effectiveness of the Allied air attack had perhaps not been altogether proportionate to its weight, the weight of enemy air attack had been practically nil. The Anglo-American troops already had entered the period when, whether massing at assembly points, moving wholesale on the roads, or advancing across country, they need worry little about danger from the skies. At this juncture, the residual Axis fighters were urgently required to escort shipping in the perilous waters of the Gulf of Tunis, nor would they otherwise have achieved much except swell the NAAF victory columns. Combats on 21st and 23d April resulted in twelve enemy fighters destroyed for the loss of two. Enemy operations over the battle area progressively diminished thereafter. Air mastery was virtually complete. Kuter believed that only the onset of the rains delayed the denouement.<sup>114</sup>

By the end of April it was clear that a breakthrough in great strength directly on Tunis, which Anderson had just failed to achieve the pre-

vious winter, was the key to the entire Axis position. Montgomery considered that a major Eighth Army assault on the mountains would serve no useful purpose. A successful II Corps blow at Bizerte depended upon strong supporting forces operating on the corps' southern flank. Moreover, Anderson believed that the forces opposite the First Army had been readied for the kill by the heavy fighting of the past week. This appreciation governed the conference Alexander held with Montgomery at the latter's headquarters on 30 April and the transfer of the 7 Armoured and 4 Indian Divisions and 201 Guards Brigade to the Medjez area. Lt. Gen. B. G. Horrocks also arrived to replace the wounded 9 Corps commander. On 3 May, 18th Army Group issued the order for the operation which brought about the sudden collapse of the enemy.<sup>115</sup>

Anderson planned to throw 9 Corps' two infantry divisions against a narrow frontage south of Djebel bou Aoukaz; to be exploited by two armored divisions, the hammer blow was designed to break the crust of the Axis resistance and crack the inner defenses of Tunis before the enemy could properly man them. The 5 Corps would cooperate by a strong preliminary attack on Djebel bou Aoukaz; XIX Corps, by moving against the difficult terrain around Djebel Zaghouan; and II Corps, by continuing its drive on Chouigui and Bizerte and swinging towards Djedeida to give additional force to 9 Corps' assault. For the main drive, an intensive artillery barrage was planned and NATAF drew up schedules for an unprecedented weight of air attack, even 205 Group's Wellingtons from distant Misurata being levied upon for the unnerving night bombing.<sup>116</sup>

Anderson feinted successfully at Pont-du-Fahs, so drawing off the 21st Panzer Division; and on 5 May, 5 Corps took Bou Aoukaz. These preliminaries over, at 0300, 6 May, the First Army artillery opened up; at dawn the infantry attacked on a 3,000-yard front, and shortly afterward, the morning mist over the Medjerda valley having providentially cleared off, the planned air program began. The enemy had been given a wakeful night by 205 Group's attacks in the Tebourba, Djedeida, and Cheylus areas and TBF's efforts against La Sebala and El Aouina. The morning was occupied with prearranged strikes designed to give depth to the artillery barrage and concentrated on an area four miles long by three and a half wide. Colonel Terrell's 47th Group, operating from Souk-el-Arba, crowded in a record number of A-20 missions before 0930—against Bordj Frendj and Djebel Achour on the axis of ad-

vance. WDAF threw 200 sorties against Furna and St. Cyprien and fighter-bombers ranging the area paid special attention to the roads. Explosions and fires were dimly seen through clouds of smoke and churning dust. By 1100 the infantry had advanced as much as a mile and German resistance began to crack. The armor duly passed through and by nightfall took Massicault. Under the climactic air and ground effort the defenses of Tunis had fallen apart.<sup>117</sup> By afternoon, the advance was so far ahead of schedule and the situation so fluid that the scale of air effort was somewhat less than might have been achieved. As it was, over 2,000 sorties were laid on, 1,000 of them before 0900.

The 6th of May also marked the GAF's last appearance in force. Fighters rising to contest the air with NAAF paid a price reported as nineteen for two. A U.S. Spitfire group was sitting over one field when twelve Me-109's attempted to get off—and the group reported that only three escaped. Convinced, Maj. Gen. Karl Koechy, commanding the Tunisian Luftgau, decided that planes and pilots should be sent to safety; and on the 7th he authorized airdrome and unit commanders to flee at discretion. Koechy and four other air generals were later captured, and generally the Luftwaffe succeeded in getting away only serviceable aircraft and pilots. Something over 600 planes—more than the Twelfth Air Force lost from November through May—remained on fields in the Tunis, Bizerte, and Cap Bon areas to attest the attrition suffered by the Axis air forces.<sup>118</sup>

German resistance crumbled away on the 7th; and in the afternoon British armor entered Tunis down the Avenue Gambetta. At almost the same hour, American armor rolled into Bizerte, which the Germans had taken care to mine and to booby-trap profusely. The II Corps had continued its advance without serious check, by way of Djebel Cheniti into Bizerte, past Mateur and the towering Djebel Achkel into Ferryville. Chouigui was also taken on the 7th and two days later British and American elements met at Protville, isolating the Germans in the hills around the old battleground of Tebourba. On the 10th the local German commander asked for terms, and for all practical purposes resistance in the II Corps area came to an end.<sup>119</sup>

The 9 Corps' armored units swung north and south from Tunis to cut the resistance into pockets and to prevent any sizable enemy force from escaping for a last ditch stand in the Cap Bon area. The enemy stood in the hills back of Hammam Lif for a time, but the 6 Armoured broke through to Soliman on 10 May and that night the advance leaped across

the peninsula to Hammamet. The British and French now converged rapidly on the remains of the Axis army. After being shelled from two sides, a large pocket of the Afrika Korps surrendered on the 11th. Von Arnim was taken next day at Ste Marie du Zit, but Messe, the stubborn defender of Mareth, held out until persuaded by a bombing attack on 12 May. With his surrender on the 13th, organized resistance ceased, and TORCH at length was complete.<sup>120</sup>

During the last phase, having to contend with very little hostile air activity, NAAF roamed the battleground at will. By 8 May the enemy retained only two landing grounds, Menzel-Temime and Korba on Cap Bon. He flew in the neighborhood of sixty sorties on the 8th, some by fighters operating out of Sicily and Pantelleria by virtue of extra tanks; substantially fewer on the 9th; and none at all during the remainder of the mop-up.<sup>121</sup> The ground situation changed too rapidly to wait for army calls, so the air forces were charged with impeding the movement of the disorganized Axis troops. On the 8th the 15th Panzer Division, fleeing south from II Corps, encountered 7 Armoured coming north from Tunis; it turned and NATAF hit it with the fighter-bombers. The division broke and subsequently surrendered on the 10th. Fighters and tactical bombers aided in forcing the defile at Hammam Lif; ranged over Cap Bon attacking troops, vehicles, and the jetties which might nurture forlorn hopes of escape; and were available to the army commanders for use against the isolated pockets around Zaghouan, in which resistance flickered and finally went out.<sup>122</sup>

AAF participation in the North African campaigns had not come by its own choice: it sent units to the Middle East because the alternative was even more distasteful; it saw in TORCH a diversion from the bomber offensive against Germany. Yet in Africa the AAF mastered in a short time and at small cost the basic principles of the difficult science of air-ground cooperation which it was to apply decisively in the overthrow of Fortress Europe.

If these principles owed much to the tutelage of the RAF, Middle East, they at the same time represented a doctrinal emphasis for which the AAF long had struggled. Spaatz, Kuter, and Stratemeyer relayed what they saw in Tunisia—what Brereton and Craig had observed in the Western Desert—and Arnold saw to it that the new doctrine went “full ball” through the War Department.

Land power and air power are co-equal and interdependent forces; neither is an auxiliary of the other. The gaining of air superiority is the first requirement

for the success of any major land operation. . . . Land forces operating without air superiority must take such extensive security measures against hostile air attack that their mobility and ability to defeat the enemy land forces are greatly reduced. Therefore, air forces must be employed primarily against the enemy's air forces until air superiority is obtained. . . . The inherent flexibility of air power is its greatest asset. . . . Control of available air power must be centralized and command must be exercised through the air force commander if this inherent flexibility and ability to deliver a decisive blow are to be fully exploited. Therefore, the command of air and ground forces in a theater of operations will be vested in the superior commander charged with the actual conduct of operations in the theater, who will exercise command of air forces through the air force commander and command of ground forces through the ground force commander.

Thus spoke Field Manual 100-20 on 21 July 1943.

## SECTION II

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### *ORIGINS OF THE COMBINED BOMBER OFFENSIVE*





## CHAPTER 7

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### *THE DAYLIGHT BOMBING EXPERIMENT*

WHEN twelve B-17's of the Eighth Air Force attacked Rouen on 17 August 1942, they inaugurated an experimental campaign of daylight bombing which was to culminate ten months later in the Combined Bomber Offensive. AAF leaders most intimately concerned, made soberly aware of the difficulty and the significance of their task by intensive study of British and German experience, were prepared to devote their earliest combat missions to testing American techniques and equipment in the war's toughest air theater. What they could not then foresee was the inordinate length of the experimental phase of their program. Competing strategic policies and the chronic scarcity of equipment and trained men, which long dogged the Allied war effort, combined to postpone until summer of 1943 the launching of a full-scale bomber offensive. With the limited forces available in the interim, the fundamental theses of strategic bombardment could hardly be given an adequate test. Hence, though the early operations of the Eighth Air Force were successful enough eventually to insure augmentation of forces, the most immediate significance of those missions lay in the tactical lessons derived therefrom.

The delay was the more vexing because from an early stage in war planning the bomber campaign against Germany had been conceived as the first offensive to be conducted by United States forces. In conversations held early in 1941 (ABC-1), Anglo-American staff representatives had agreed on certain basic assumptions which should guide combined strategy if the two nations found themselves at war with the European Axis and Japan: that the main Allied endeavor should be

directed first against Germany as the principal enemy; that defeat of Germany would probably entail an invasion of northwestern Europe; and that such an invasion could succeed only after the enemy had been worn down by various forms of attrition, including "a sustained air offensive against German Military Power, supplemented by air offensives against other regions under enemy control which contribute to that power."\*

Those basic assumptions had guided proposed deployments in the operations plan (RAINBOW No. 5) current among the U.S. armed forces on the eve of Pearl Harbor. They had guided also the AAF's first air war plan, by virtue of which heavy claims had been levied against the nation's manpower and material resources. That plan (AWPD/1, 11 September 1941) had indeed subordinated air activities in all theaters to a protracted program of strategic bombardment of Germany on a scale hitherto unheard of. The early successes of the Japanese had seriously challenged the practicability of adhering to those plans, but in spite of the necessity of dispatching reinforcements to the Pacific the Combined Chiefs of Staff had stood firmly upon previous agreements. Proposals accepted in January 1942 for early deployment of heavy bombers in the United Kingdom were of necessity couched in modest terms, but in mid-April the Combined Chiefs and their respective governments had agreed to mount a cross-Channel invasion—preferably in spring 1943 (ROUNDUP), but if urgently required in September 1942 (SLEDGEHAMMER). Plans for the build-up of forces (BOLERO) were given high priority. With either D-day, the time allowed for softening up the enemy by bombing the sources of his military power would be more limited than had been contemplated in AWPD/1; counter-air activities and air support of ground operations became in prospect relatively more important. Hence, though BOLERO promised to quicken the flow of AAF units to the United Kingdom, it changed somewhat the nature of the force to be deployed and, in anticipation, the character of its mission.

AAF plans to organize, equip, and base an air force in the United Kingdom were brought rapidly to maturity.† The Eighth Air Force, activated in January 1942 and committed to BOLERO early in April, began its move across the Atlantic in May. Under the leadership of

\* Early developments of policy affecting the role of the AAF in a European war have been discussed in Vol. I of this history, *passim*.

† See especially Vol. I, 557-654.

Maj. Gen. Carl Spaatz, the force had been organized into bomber, fighter, composite (for training), and service commands. Under Brig. Gen. Ira C. Eaker the VIII Bomber Command (with which this chapter is most intimately concerned) had been organized into three wings, based in East Anglia: the first, under Col. Newton Longfellow, with headquarters at Brampton Grange; the second, under Col. James P. Hodges, at Old Catton; the third, under Col. Charles T. Phillips, at Elveden Hall.<sup>1</sup> Of the heavy bombardment groups allocated to the Eighth Air Force, only one, the 97th, had become operational by 17 August, but others were in training, at staging areas, and en route from the United States. Early in July, AAF Headquarters had estimated the BOLERO build-up of air units by 31 December 1943 at 137 groups, including 74 bombardment groups (41 heavy, 15 medium, 13 dive, and 5 light), 31 fighter groups, 12 observation groups, 15 transport groups, 4 photo groups, and 1 mapping group. Arrangements had been effected with the British to provide 127 airdromes and such other installations as would be required for an air force expected ultimately to constitute fully half the projected combat group strength of the AAF.<sup>2</sup>

By the beginning of August 1942, BOLERO plans had been thrown into a state of grave uncertainty by the decision to undertake an early invasion of North Africa. This meant an indefinite postponement of the cross-Channel push and the diversion to TORCH, as the new venture was called, of much of the air power previously allocated to BOLERO. The bomber offensive against Germany was not eliminated from Allied strategy—operations of the RAF Bomber Command went uninterrupted along—and the new timetable, by postponing the continental invasion until probably 1944, coincided more accurately than the BOLERO plans with previous AAF thought. But with TORCH the Eighth Air Force had suffered, in anticipation, a heavy loss. This was the second blow within a week. Late in July it had been decided that AAF commitments to BOLERO would be readjusted in favor of the Pacific war. There were those, especially in the U.S. Navy, who argued with some cogency and much energy that the chief weight of American arms should be thrown first against Japan, and under the circumstances the immediate reallocation of fifteen groups from BOLERO to the Pacific had to be viewed as a temporary compromise rather than as a final settlement of the dispute. In the face of these diversions, fulfilment of the ambitious plans of the AAF for its bomber offensive would mean a top priority, possibly even an overriding prior-

ity, for the production of airplanes, especially of heavy bombers. Already in 1942 the eventual limits of American productive capacity could be fairly gauged, and such a priority would conflict seriously with programs considered essential by the Army Ground Forces and the Navy, both of which had behind them the force of military tradition. Thus the fate of the American bomber offensive involved most difficult problems of strategy and logistics. For the Eighth Air Force there was a tactical problem as well, and on its solution hinged much of the answer to the broader issues.

The problems could be more simply stated than answered. Could Anglo-American bomber forces strike German production forces often enough and effectively enough to make the eventual invasion appreciably less costly? Could the forces required be provided without unduly hampering air activities elsewhere and the operation of the other arms in any theater? Could the bomber campaign be conducted effectively within acceptable ratios of losses? For those questions the RAF had answers which, if not conclusive, were founded upon experience. Their bombing of industrial cities had in recent attacks wrought great destruction; they had secured a favorable position for the heavy bomber in the allocation of production potential; and in their night area bombing they had learned to operate without prohibitive losses.

The Eighth Air Force, as yet without experience, had no answers. The basic concept of a combined bomber offensive presumed complementary operations of RAF night bombers and AAF day bombers. American doctrine called for the destruction of carefully chosen objectives by daylight precision bombing from high altitudes. Whether those techniques could be followed effectively and economically in the face of German flak and fighter defenses and under weather conditions prevailing in northwestern Europe remained to be proved. Many in the RAF were politely skeptical; Eighth Air Force leaders were guardedly optimistic. But the problem was crucial: upon its successful solution hung the fate of the Eighth's participation in the combined offensive and of the Eighth's claim to a heavy share of the forces later available. So it was that the tiny force of B-17's which struck at the Rouen-Sotteville marshalling yard on 17 August was watched with an intensity out of all proportion to the intrinsic importance of the mission.\* So it was too that, in the months which followed, Eighth Air Force officers continued to experiment, weighing as carefully as they might

\* See Vol. I, 655-68.

the evidence provided by combat missions and trying desperately to overcome difficulties which stemmed in no inconsiderable part from the attenuated size of their force.

### *Controls and Target Selection*

Whatever uncertainties may have faced the Eighth Air Force in August 1942, its leaders were anxious to get available bomber units into action at the earliest opportunity. The general mission had for the moment been clarified. As late as 21 July, Eisenhower, as theater commander, had defined the task of the Eighth in terms of the contemplated invasion of the continent—to achieve air supremacy in western France and to prepare to support ground operations. TORCH had outmoded that directive. By the first of August, Eaker could describe the job of his VIII Bomber Command as the destruction of carefully chosen strategic targets, with an initial “subsidiary purpose” of determining its “capacity to destroy pinpoint targets by daylight accuracy bombing and our ability to beat off fighter opposition and to evade antiaircraft opposition.” To accomplish these general objectives it was necessary to establish a definite system of operational control which would mesh AAF and RAF efforts and to determine specific target systems appropriate to the U.S. forces at hand.

Although the Eighth Air Force was established within the normal chain of command in the ETO, its bombing policy was supposed to originate with the Combined Chiefs of Staff, who were to issue the necessary strategic directives through the Chief of Staff, U.S. Army.<sup>3</sup> For all practical purposes, however, such policy was left during this period to American commanders in the United Kingdom, who worked in closest cooperation with the appropriate RAF authorities. Much of the success of that cooperation derived from friendly personal relations between the two forces; the most formal definition of their mutual responsibilities consisted of the Joint American/British Directive on Day Bomber Operations Involving Fighter Cooperation, dated 8 September 1942.\* Worked out by the RAF and General Spaatz, this document, as its title suggests, had been evoked by the Eighth's current dependence upon British fighter escort.

Declaring that the aim of daylight bombing was “to achieve continuity in the bombing offensive against the Axis,” the directive laid responsibility for night bombing on the RAF, for day bombing on the

\* For full text, see Vol. I, 608-9.



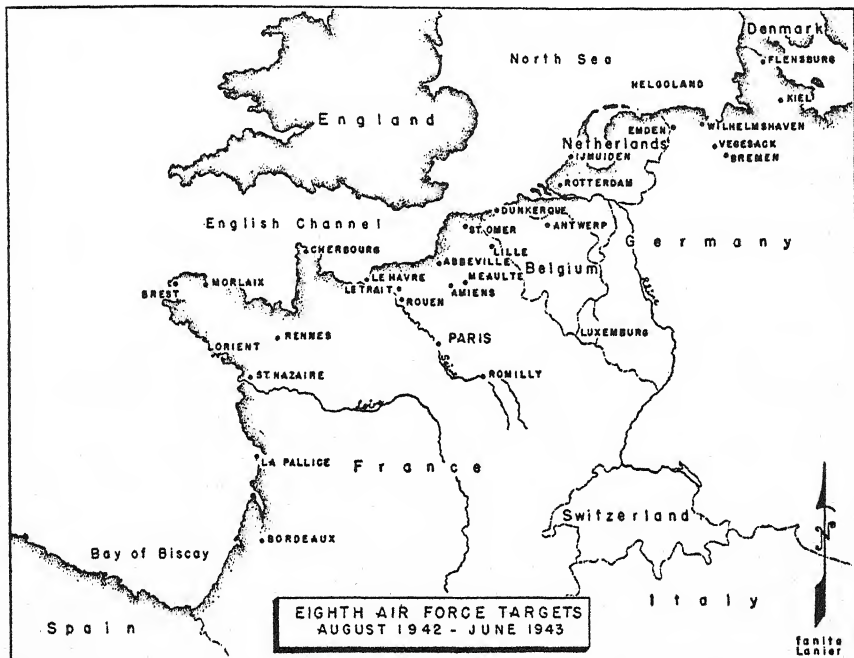
Eighth, which should accomplish its mission "by the destruction and damage of precise targets vital to the Axis war effort." The daylight offensive was to develop in three phases marked successively by the increasing ability of the American force to provide its own fighter escort and to develop tactics of deep penetration. In the first phase, where the RAF would furnish most of the fighter support, targets would be limited to those within tactical radius of the short-range British fighters. As more U.S. fighters became available, they would provide direct support while the RAF flew diversionary sweeps and gave withdrawal support. Eventually the AAF would take over most of the task, requesting aid when necessary. Practical measures for control were described. During the first phase—with which this chapter is concerned—the commanding general of VIII Bomber Command was to initiate offensive operations, making preliminary arrangements for fighter support with the commander of VIII Fighter Command, who in turn would consult his British opposite number for detailed plans and assignment of forces.

Target selection, as periodically reviewed "within the existing strategy," was to be the responsibility of the commanding general of the Eighth Air Force and the assistant chief of Air Staff for operations (British). To coordinate planning effectively, provision was made at Spaatz' suggestion for regular meetings between the American command and the British Air Staff. Meeting first at the Air Ministry on 21 August, this group subsequently bore the cumbersome title of Committee on Coordination of Current Air Operations. In all, sixteen meetings were held between 21 August and 5 February 1943—at weekly intervals before December, thereafter only as required. Thus the establishment of target priorities and the selection of particular targets, though primarily tasks for the Eighth Air Force, were subject to constant review in terms of over-all Allied strategy and of RAF operations. Among other advantages, this insured the AAF access to RAF target intelligence, still indispensable to the Americans. In addition to this liaison machinery at the air staff level, provision was made also for closest coordination between staff officers of VIII Bomber Command and RAF Bomber Command, and Eaker made it a point to attend the operational conferences of the latter organization at Southdown.<sup>4</sup>

Meanwhile, actual target systems for the earliest phase of the offensive were being selected. VIII Bomber Command had received its first bombing directive early in August. The Eighth Air Force had declared

## THE DAYLIGHT BOMBING EXPERIMENT

as its general aim destruction of the enemy's will and ability to wage war. Since his will to fight at present depended, it was thought, upon the success of his land armies and of his submarine campaign, the daylight bombing effort should be directed against (1) the factories, sheds, docks, and ports in which he built, nurtured, and based his U-boats, (2) his aircraft factories and other key munitions establishments, and (3) his lines of communication. By 14 August this program had re-



ceived additional refinement and some alteration. Daylight bombing objectives were then divided into two categories: a general objective which might be attacked anywhere in Europe with cumulative results; and a series of precise targets which could be attacked only when conditions were favorable but which, if destroyed, would seriously affect the German war effort. The rail transportation system constituted the general objective. Precision objectives, in order of priority, were fighter-plane assembly plants, Ruhr power plants, and submarine installations.<sup>5</sup> Then on 25 August, in accordance with a decision reached in the commanders' meeting on the previous day, Spaatz issued to VIII Bomber Command a list of specific targets, all in occupied France or the Low Countries. First priority was given to aircraft fac-

tories and repair depots, next came marshalling yards, then submarine installations. Some miscellaneous targets previously authorized for attack, such as the Ford and General Motors plants at Antwerp, remained eligible.<sup>6</sup>

This list, except for the subsequent removal of the Antwerp plants, appears to have governed operations of the Eighth until 20 October 1942. It differed radically from that which had been suggested a year earlier in AWPD/1. Some changes from that previous plan were to be expected as the tactical situation fluctuated, but to no small degree the actual choice of targets in August was determined by the current weakness of the force. The tactical radius of RAF fighters limited the choice to objectives on or near the European coast. Missions of shallow penetration offered an excellent opportunity for the fledgling air force to find its wings, but the fact that those objectives lay wholly in friendly occupied countries was to raise political problems of some delicacy.

### *The First Fourteen Missions*

The first mission had been flown by Fortresses and crews of the 97th Group from its East Anglian base at Polebrook.\* The nervous tension common to a maiden effort had been heightened by repeated postponement of the mission, and when the little force of B-17's finally bombed their first target without loss and with greater accuracy than had been expected from green crews the event did much to raise the morale of American airmen of all echelons.

The second mission, flown two days later, did nothing to diminish that warm feeling of accomplishment. On the 19th, B-17's of the 97th Group (this time twenty-four of them) made an attack on the Abbeville/Drucat airdrome. The mission had been planned as part of the air operations undertaken in connection with the Dieppe raid. According to Air Marshal Sir Trafford Leigh-Mallory, it appeared "that the raid on Abbeville undoubtedly struck a heavy blow at the German fighter organization at a very critical moment during the operations" and thus "had a very material effect on the course of the operations."<sup>7</sup> RAF fighter pilots flying over the airdrome on the day following the attack reported the main dispersal area to have been apparently "completely demolished." Subsequent reconnaissance indicated somewhat less cataclysmic devastation.<sup>8</sup>

It was not until Mission 9, on 5 September 1942, that VIII Bomber

\* For a full discussion, see Vol. I, 661-68.

Command again equaled the force sent out on 19 August. Meanwhile, light missions were flown to targets consisting of the Longueau marshalling yards at Amiens, a vital focal point in the flow of traffic between France and northern Germany; the Wilton shipyard in the outskirts of Rotterdam, the most modern shipyard in Holland and one employed to capacity by the Germans for servicing surface vessels and submarines; the shipyard of the Ateliers et Chantiers Maritime de la Seine, at Le Trait; the well-equipped airplane factory of Avions Potez at Meaulte, an installation used extensively by the enemy as a repair depot for the near-by fighter base; and the Courtrai/Wevelghem air-drome, a base for Luftwaffe FW-190 fighters. All lay within easy fighter range and required at most only shallow penetration of enemy-occupied territory.<sup>9</sup>

These six missions followed the pattern laid down by the preceding two. The B-17's flew under heavy fighter escort, provided largely by the RAF, and bombed at altitudes from 22,000 to 26,000 feet in circumstances of generally excellent visibility. They encountered for the most part only slight enemy opposition. No B-17's were lost. On 21 August, however, during an unsuccessful attempt to bomb the Wilton shipyard the bombers had a brisk battle with enemy aircraft.<sup>10</sup> They were sixteen minutes late for their rendezvous with the RAF fighter escort, and as a result the escort was able to accompany them only halfway across the Channel. The bomber formation received a recall message, but by that time it was over the Dutch coast. While unescorted it was attacked by twenty to twenty-five Me-109's and FW-190's. A running fight ensued which lasted for twenty minutes, during which time both the pilot and co-pilot of one B-17 were wounded, the co-pilot so seriously that he died soon after. The gunners claimed two enemy fighters destroyed, five probably destroyed, and six damaged. It was the first time the Fortresses had been exposed to concerted fighter attack without the protection of friendly aircraft, and the results must have impressed the enemy pilots with the ability of the Fortress to defend itself.<sup>11</sup>

Bombing accuracy continued to be good for inexperienced crews. In each case enough high-explosive and incendiary bombs fell in or near the target areas to prompt General Eaker to predict that in the future 40 per cent might be expected to fall within a radius of 500 yards from the aiming point.<sup>12</sup> These half-dozen missions demonstrated, however, that bombing which could be considered fairly accurate might

not produce a corresponding measure of damage to the target. On the mission to Le Trait, for example, although twelve bombs out of a total of forty-eight dropped were plotted within 500 yards of the aiming point, no material damage was apparently done to the shipyard installations themselves. Again in the attack on the Potez aircraft factory, ten craters were made which paralleled the target, close enough to it to be considered fairly accurate but far enough to land harmlessly in open fields.<sup>13</sup>

In Mission 9 the American bombers again struck at the Rouen-Sotteville marshalling yard. The force was the largest yet dispatched. Thirty-seven B-17's took off, twenty-five from the 97th Group and twelve from the 301st, the latter on their first combat mission. Thirty-one planes bombed the target (the locomotive depot), the other B-17's being unable to drop their bombs on account of mechanical failures. The bombers met little enemy opposition, although the RAF fighters supporting were challenged by a few FW-190's.<sup>14</sup>

A large percentage of the bombs, almost one-fifth of the high-explosive bombs dropped, burst within the marshalling yard installations.<sup>15</sup> Photo reconnaissance made almost a month later, on 2 October, indicated that, while practically the entire damage to the running lines throughout the yards had been repaired, the transshipment sheds and the locomotive depot were in very restricted operation. On 8 August, forty locomotives had been observed on the tracks around the latter; now only eighteen could be detected.<sup>16</sup>

To the local French population the success of the mission appeared less conclusive than it had to observers in the United Kingdom. A large number of bombs had in fact fallen outside the marshalling yards, many of them in the city itself, and several far enough from the target to seem to a ground observer to have borne little relation to any precise aiming point. As many as 140 civilians, mostly French, had been killed, and some 200 wounded.<sup>17</sup> One bomb, fortunately a dud, was reported to have hit the city hospital, penetrating from roof to cellar.<sup>18</sup>

Beginning with the tenth mission on 6 September, VIII Bomber Command encountered greatly increased fighter opposition. Indeed it was during that day's operations over occupied France that the command suffered its first loss of aircraft in combat. Hitherto it had appeared that the B-17's bore charmed lives; but then the enemy attacks had been light in weight and tentative in character. From now

on, the Fortresses had a chance to show what they could do in the face of relatively heavy and persistent fighter resistance.

On 6 September, heavy bombers of the 97th Group, augmented to a strength of forty-one by elements from the newly operational 92d Group, were sent out again to strike the Avions Potez aircraft factory at Meaulte. In order to keep enemy fighters on the ground and provide a diversion for the main force, thirteen B-17's of the 301st Group attacked the German fighter airdrome at St. Omer/Longuenesse. Similarly, twelve DB-7's of the 15th Bombardment Squadron (L) attacked the Abbeville/Drucat airdrome.<sup>19</sup> In spite of these diversionary efforts, all crews on the primary mission reported continuous encounters from the French coast to the target and from the target back to the French coast. As a result of perhaps forty-five to fifty encounters, mostly with FW-190's, the B-17 crews claimed several enemy aircraft destroyed or damaged. Two of the heavy bombers failed to return. Many encounters also took place between FW-190's and the supporting RAF fighters.<sup>20</sup> The bombing at Meaulte seems to have suffered little in accuracy from the distracting fighter attacks, for it was, if anything, more accurate than on the previous attack against the same target and probably more effective.<sup>21</sup>

A similarly bitter aerial battle resulted when, on 7 September, a force of twenty-nine B-17's made an attack on the Wilton shipyard near Rotterdam, the ineffectiveness of which resulted from adverse weather rather than from enemy action. Again the claims registered by the bomber crews were surprisingly high: twelve destroyed, ten probably destroyed, and twelve damaged.<sup>22</sup> Even discounting the optimistic statistics of the gunners, it seemed evident that the Fortresses could take care of themselves in a surprisingly competent fashion.

Gunners did not again have the opportunity to test their ability until 2 October. Meanwhile, persistently bad weather, together with a directive ordering all combat activity of the Eighth Air Force to take second place to the processing of units destined for North Africa, had discouraged further operations.<sup>23</sup> On 2 October, thirty-two B-17's bombed the Avions Potez factory at Meaulte for the third time, while six of the heavies attacked the German fighter airdrome at St. Omer/Longuenesse for the second time. All bombers returned but they met constant and stubborn fighter opposition. So many encounters took place that crews had to be interrogated a second time and even then the claims registered were considered too high.<sup>24</sup> This aerial battle was all



the more remarkable because the heavy bombers had flown under the cover, direct or indirect, of some 400 fighter aircraft, in spite of which the Germans had been able to drive home their attacks on the bombers. Whatever damage was inflicted on the aircraft repair and airdrome facilities—and several direct hits were scored—was swallowed up in the enthusiasm engendered by the remarkable defensive power displayed by the Fortresses.<sup>25</sup>

The day bombing campaign reached a minor climax in the mission against Lille on 9 October. It was the first mission to be conducted on a really adequate scale and it marked, as it were, the formal entry of the American bombers into the big league of strategic bombardment. Then, for the first time, the German high command saw fit to mention publicly the activities of the Flying Fortresses, although they had already made thirteen appearances over enemy territory. Lille's heavy industries contributed vitally to German armament and transport. The most important of these industries, the steel and engineering works of the Compagnie de Fives-Lille and the locomotive and freight car works of the Ateliers d'Hellemmes, constituted one composite target.<sup>26</sup>

The mission had been planned on an unprecedented scale. One hundred and eight heavy bombers, including twenty-four B-24's from the newly operational 93d Group, were detailed to attack the primary target at Lille, and seven additional B-17's flew a diversionary sweep to Cayeux. Of the aircraft dispatched, sixty-nine attacked the primary target;<sup>27</sup> two bombed the alternative target, the Courtrai/Wevelghem airdrome in Belgium; six attacked the last resort target, the St. Omer airdrome; two bombed Roubaix; and thirty-three (including fourteen of the B-24's) made abortive sorties. Approximately 147 tons of 500-pound high-explosive bombs and over 8 tons of incendiaries fell on Lille.<sup>28</sup>

The bombing this time did not demonstrate the degree of accuracy noticeable in some of the earlier and lesser efforts. Of 588 HE bombs dropped over Lille, only 9 were plotted within 1,500 feet from the aiming points. Many fell beyond the two-mile circle, some straying several miles from the target area.<sup>29</sup> The errors may be explained in part by the fierce fighter attacks sustained by the bombers over the target, but they no doubt also owed much to the inexperience of at least two of the groups participating.<sup>30</sup> A large proportion of the bombs fell on the residences surrounding the factory at Fives-Lille. Civilian casualties were placed by a ground observer at forty dead and ninety

wounded.<sup>31</sup> Ground intelligence sources also reported that a large percentage of the bombs failed to explode.<sup>32</sup>

Yet, despite a scattered bomb pattern and numerous duds, several bombs fell in the target area—enough, in any event, to cause severe damage to both targets, together with considerable incidental damage to industrial and rail installations.<sup>33</sup> Ground observations made by Fighting French informants credited the U.S. forces with completely stopping work at the Hellemmes textile factory and with doing severe damage to the power station, the boiler works, and the turbines at the Fives-Lille establishment. A branch line to another power station apparently relieved the enemy's situation, however, for work in the factory was resumed after a relatively brief time.<sup>34</sup>

Again, as in the Potez mission of 2 October, the question of bomb damage came to be overshadowed by that of the day bomber's ability to defend itself against fighter attack. As in that mission, the attacking Me-109's and FW-190's concentrated on the bombers to the practical exclusion of the combined British and U.S. fighter escort, which in this instance numbered 156 aircraft, including 36 P-38's from the VIII Fighter Command.<sup>35</sup> Unusually heavy fighter opposition brought reports of numerous combats. Three B-17's and one B-24 failed to return, although the crew of one Fortress was picked up at sea. In all, thirty-one crew members were reported missing and thirteen wounded, four B-17's suffered serious damage, and thirty-two B-17's and ten B-24's were slightly damaged by fighter action.<sup>36</sup> Those losses were subject to immediate and positive confirmation; the damage inflicted upon the GAF was less readily assessed.

Initially, it was reported that the bombers had destroyed fifty-six fighters, probably destroyed twenty-six, and damaged twenty. According to these figures, the Fortresses had put out of action 102 enemy planes—more than 15 per cent of the estimated GAF fighter strength in western Europe. British intelligence believed that no more than sixty enemy aircraft could possibly have intercepted. This discrepancy called for a re-estimate of losses inflicted in the Lille mission and confirmed the belief, engendered by the uniformly high claims on earlier missions, that VIII Bomber Command was in need of a system of interrogation and evaluation that would prevent such inflation in the future. By 24 October the Lille claims had been scaled down to twenty-five destroyed but with a listing of thirty-eight probables and forty-four damaged for a grand total in excess of the original figure. In January

1943 a general review of early combat reports reduced the figures for this engagement to twenty-one destroyed, twenty-one probably destroyed, and fifteen damaged.<sup>37</sup> These more conservative figures argued little against the earlier conclusion at AAF Headquarters that the Lille mission offered convincing evidence that the day bombers "in strong formation can be employed effectively and successfully without fighter support."<sup>38</sup> But it is now apparent from enemy sources that this optimistic view was justified by the ability of the bombers to get through to the target and to return with limited losses rather than by any serious losses inflicted upon enemy fighter forces. Actually, the Germans listed one fighter destroyed in the Lille action and none damaged. One other fighter lost that day could possibly be credited indirectly to the effects of combat with the American planes. In short the maximum possible score was 2, not 102 or 57.\*

Although it is difficult to explain so gross an exaggeration, the chief source of error was easily diagnosed. It was hard for crews in a large formation to determine which bomber had been responsible for an apparently destroyed or damaged German plane, so that each gunner who had fired at the enemy fighter from a reasonable range was likely to claim it: one fighter actually shot down might be multiplied into a dozen in the final report. The crew member, however honest in intent, could hardly qualify as a detached witness. From his battle station, vision was straitly limited and his impressions of a complex and incredibly swift action must inevitably be faulty and incomplete; the promised award of a decoration for his first kill of a German plane did little to dissuade him from the not unnatural belief that it had been *his* bullet which had scored. These difficulties appear obvious in retrospect—and one may hope that they would so have appeared at the time to one familiar with the ordinary canons of historical analysis—but they presented a problem for which the interrogating officers had not been fully prepared. They had learned at the intelligence school at Harrisburg, Pennsylvania, how to evaluate most of the important information elicited from a returning crew, particularly that concerning bombing results. But as late as 24 August 1942 the training manual on bomber crew interrogation did not even suggest, as part of the check list of questions, the query, "Were there other bombers firing at the enemy

\* Information supplied through the courtesy of the British Air Ministry and based on German Air Ministry returns compiled by the General Quartermaster's Department for the purpose of ascertaining replacement requirements and for personnel records.

fighter claimed as destroyed?" Harrisburg had been strongly influenced by RAF intelligence procedure, and it may be that the lack of English experience in day bomber battles over Europe helps account for this important omission. At any rate, the previously neglected question soon became a most important part of the interrogation.<sup>39</sup>

Stirred by the palpable improbability of the Lille claims, VIII Bomber Command made a prompt attempt to tighten up the interrogation procedure. Although crews were interrogated immediately on their return, before their first impressions of the battle had been distorted by reflection or a creative imagination, the pattern of any considerable battle was exceedingly difficult to re-create. By the end of the year it was becoming common practice to diagram all combats resulting in claims.<sup>40</sup> Finally, on 5 January 1943, VIII Bomber Command headquarters issued the following rules governing evaluations. An enemy plane would be counted as destroyed when it had been seen descending completely enveloped in flames, but not if flames had been merely licking out from the engine. It would be counted as destroyed when seen to disintegrate in the air or when the complete wing or tail assembly had been shot away from the fuselage, but not if a wheel or some other part of the airplane had been shot away. Experience with many an AAF plane had demonstrated that a badly wounded plane might return and land safely. Single-engine enemy planes would be counted destroyed if the pilot had been seen to bail out. The "probably destroyed" category would include planes for which no certainty of destruction existed but where the intensity of flames or extent of damage seemed to preclude chance of a successful landing. An enemy plane could be claimed as damaged when any of its parts were seen shot away. Every effort would be made to reduce future claims and to eliminate crediting the same German fighter to two or more gunners.<sup>41</sup>

In accordance with these principles, claims registered since the beginning of operations were reviewed. By previous standards, claims for all missions through 3 January 1943 had totaled 223/88/99. The new yardstick set them at 89 destroyed (a reduction of 60.1 per cent), 140 probably destroyed, and 47 damaged,<sup>42</sup> a revision which did much to satisfy critics on both sides of the Atlantic.<sup>43</sup> Even so, the figures were still too high, as has already been indicated in the case of the Lille mission of 9 October. That mission and an attack against Romilly-sur-Seine on 20 December\* were the most important in respect to claims in

\* See below, pp. 256-58.

the period before 3 January. Together they accounted for adjusted total claims of 42/52/22. Enemy sources reveal, however, that the total score was possibly no more than three planes destroyed and one damaged, and certainly no more than seven destroyed and eleven damaged.\* Even under the new directive of 5 January, claims continued to be often inaccurate and seldom on the conservative side, a conclusion supported by a check of enemy records of critical air battles falling within the limits of this volume.†

The failure to develop a more reliable method of estimating enemy losses was of grave significance. Public relations were inevitably involved. It is difficult to avoid the conclusion that the evaluations, especially in the early days, reflected a natural desire, existing all along the line from the combat crew to AAF Headquarters, to prove the case for daylight bombing. Inflated reports, widely published, sometimes had to be corrected to the embarrassment of the AAF. But the figures on GAF losses, however newsworthy, were not collected to adorn headlines; they constituted a type of intelligence indispensable for the strategic planner, and it was in realization of the need for accurate data that Eighth Air Force leaders strove to correct current mistakes. Those efforts did much to instill into the minds of crew members a more conservative attitude. The story (probably apocryphal) is told of a gunner on the Wilhelmshaven raid of 27 January 1943 who, on observing an intercepting enemy plane blow up not a hundred yards from the bomber, nudged a comrade who had been firing at it and asked "Do you want to claim that one?"—to which the second gunner replied "No, I didn't see it crash."<sup>44</sup> Claims continued to run excessively high, as will be shown in subsequent accounts of the great air battles of 1943-44, but in general the mistakes seem to have derived from an honest failure to solve the problem of reporting and evaluating a most complex operation.

Whatever concern Eighth Air Force leaders may have had for favorable publicity they realized the experimental nature of their early operations and attempted to interpret the data revealed by them in as

\* The figures, based upon returns compiled by the General Quartermaster's Department of the German Air Ministry, are exclusive of planes destroyed or damaged on the ground at Romilly.

† At the author's request, the record has been checked by the British Air Ministry for the following missions in addition to those already indicated: Wilhelmshaven (27 January 1943); Bremen (17 April); Kiel (14 May); Bremen (8 October); Gdynia, Anklam, Marienburg (9 October); Münster (10 October); Schweinfurt (14 October).

nearly a scientific fashion as possible. That effort was reflected in the Eighth's employment, as early as October 1942, of civilian experts trained in statistical analysis and in various other scientific disciplines pertinent to the study of the operations of a strategic bombing force. The work of this group, called originally the Operational Research Section, did not bear fruit until 1943, but during that year it was responsible for a review of many operational problems which led to significant tactical developments. The desire for full and reliable operational data led also to the development of a standardized mission report which consolidated all pertinent information from the combat units and the several staff sections. Compiled for current use of the tactical analyst, these reports have since become for the historian a source of invaluable information. So complete, indeed, were the mission reports and so accurate in most respects other than claims on enemy losses, that the historian rarely finds it necessary to utilize the operational records of the lower echelons. Upon completion of the first twenty-three missions (17 August to 23 November) an attempt was made to consolidate all valuable information on each mission and to analyze certain significant problems raised by three months of operations. This report, called "The First 1100 Bombers," affected in turn the system of mission reporting. It has been used extensively as a source for this chapter.

Even before compiling that report the Eighth Air Force had begun to take stock. Whatever the score in combat may have been by early October, the first fourteen missions had been on the whole very encouraging. Targets had been attacked with reasonable frequency, especially during the first three weeks, and hit with a fair degree of accuracy. During the first nine missions, the Germans had evidently refused to take the day bombing seriously. The American forces had been small and the fighter escort heavy, and so the Germans had sent up few fighters, preferring to take the consequences of light bombing raids rather than to risk the loss of valuable aircraft. And when the German fighters did take to the air, they exhibited a marked disinclination to close with the bomber formation.<sup>45</sup> The bombing had been more accurate than most observers had expected.<sup>46</sup> Indeed, it was a tribute of sorts to the accuracy of the Americans that after the ninth mission enemy fighter opposition suddenly increased. And it was a source of satisfaction to the AAF commanders that the B-17's and the B-24's appeared more than able to hold their own against fighter attacks, even with a minimum of aid from the escorting aircraft. As for antiaircraft



defenses, at no time had they presented a serious threat to the bombers. After the tenth mission a marked increase in damage became apparent, but as yet the day bombers had suffered nothing to compare with the losses reported by the RAF on their night raids at lower altitudes.<sup>47</sup> No heavy bombers had been lost from flak, and only minor damage had been sustained. On the other hand, six aircraft were destroyed by enemy fighters. It began to look as if altitude alone might provide decisive protection against antiaircraft; but events were to demonstrate that this forecast was too hopeful.

Eighth Air Force commanders were in an optimistic mood by 9 October 1942 and, in a measure, justifiably so. Possibly the early expressions of opinion, made after the first week of operations, had been a little too sanguine. On 27 August, for example, General Eaker had informed General Spaatz that the U.S. bombers gave promise of being able to place 90 per cent of their bombs within the one-mile radius, 40 per cent within 500 yards, 25 per cent within 250 yards, and 10 per cent dead on the aiming point, or within a "rectangle 100 yards on the side." Therefore, given a force of ten groups of heavy bombers, enemy aircraft factories could be destroyed to the point where they could not supply the field forces, and submarine activity could be "completely stopped within a period of three months by destruction of bases, factories and docks." Granting that weather would be bad in the United Kingdom for day bombing, he believed that at least ten missions per month would be possible. Although a larger force could be handled and would be advisable, ten groups in 1942, and ten additional by June 1943, would be adequate, "coupled with the British night bombing effort, completely to dislocate German industry and commerce, and to remove from the enemy the means for waging successful warfare."<sup>48</sup> General Spaatz declared himself entirely in accord with this estimate and spoke of the "extreme accuracy" of the American bombers.<sup>49</sup>

AAF Headquarters in Washington received these reports with some reservations. Rather than "extreme accuracy," headquarters agencies preferred to speak of the "fair accuracy" achieved in the first missions. Bombing had been accurate in relation to European standards rather than according to any absolute standard, an opinion which General Spaatz himself expressed on further reflection.<sup>50</sup> Nevertheless, it was possible for analysts in the office of AC/AS, Intelligence, looking back over the entire fourteen missions, to share General Eaker's optimism

and to accept his estimates regarding both accuracy and force required.<sup>51</sup>

These early missions had also made a noticeable impression on British opinion. If not as enthusiastic as their American allies, British observers in September and October were at least ready to admit that the AAF day bombers and the policy of day bombardment showed surprising promise. As early as 24 August, General Spaatz reported a significant change of mind on the part of the RAF. In a statement which, among other things, indicates how tentative had been the British official acceptance of the American bombardment doctrine, he stated that the RAF was now willing to alter its conception of the nature of daylight bombing operations from one wherein the bombers were to be used mainly as bait to lure the enemy fighters into action to one in which the bombing had become the principal mission and the supporting fighters were employed to further that effort rather than to attack the German Air Force.<sup>52</sup> General Eaker wrote at about the same date that the British "acknowledge willingly and cheerfully the great accuracy of our bombing, the surprising hardihood of our bombardment aircraft and the skill and tenacity of our crews."<sup>53</sup>

A review made by the Air Ministry of the B-17 operations from 17 August to 6 September substantiated this interpretation. It referred to the high standard of accuracy attained, considering the inexperience of the crews. It pointed to the fact that in ten missions only two aircraft had been lost, owing to the ineffectiveness of the flak at high altitude and to the ability of the Fortress to take care of itself against fighter attack. "The damage caused, commensurate with the weight of effort expended, is considerable," the report read, adding (quite rightly) that complete destruction of any of the targets attacked with the forces at present available could not have been expected. But, it concluded—with some enthusiasm though little appreciation of what the AAF hoped to accomplish in its bombing offensive—if only these Fortresses were employed on night operations the effectiveness of the area bombing program could be raised from its current rate of 50 per cent to 100 per cent, and a decisive blow could be dealt to German morale during the coming winter!<sup>54</sup>

British press opinion, which in mid-August had been cool, if not hostile, to the day bombing project, showed a similar change of tone. On 1 September, Colin Bednall wrote in the *Daily Mail* as follows: "So remarkable has been the success of the new Flying Fortresses operated

by the US AAF from this country that it is likely to lead to a drastic resorting of basic ideas on air warfare which have stood firm since the infancy of flying."<sup>55</sup> Peter Masfield, whose comments on the eve of the first Fortress mission had been decidedly critical of the American bombers and patronizing towards their capabilities, revised his judgment frankly, but somewhat more gradually.<sup>56</sup> Prior to the Lille mission of 9 October he stoutly maintained that the B-17's needed escort and that therefore their effective range was limited absolutely to the range of the escorting fighters. "There is no doubt [he concluded] . . . that day bombing at long range is not possible as a regular operation unless fighter opposition is previously overwhelmed or until we have something too fast for the fighters to intercept." Then, he believed, but only then, the entire Allied bombing force might well be turned to day bombing.<sup>57</sup>

After the USAAF operation of 9 October he declared that the question "Can we carry day air war into Germany?"—which had hitherto been answered in the unqualified negative—was now subject to a new assessment. It might be that altitude and firepower could some day make deep penetrations of enemy territory feasible. Several factors, however, still limited the range of the U.S. bombers: any raid to Germany would as yet have to be conducted beyond effective fighter range; long distance flights would give the enemy warning system sufficient time to work at maximum efficiency; bomber ammunition would likely run low in protracted encounters with enemy aircraft which would be free to attack in the most effective manner, unhampered by escort fighters; and finally weather over Europe between November and March was "not particularly favourable for high-flying operations." Thus true air superiority remained confined to the range of the fighter, and cloud and darkness still offered the best cover for bombing attacks. But Masfield ended his article of 18 October in a pliable frame of mind. "The Americans have taught us much; we still have much to learn—and much we can teach."<sup>58</sup>

This cooperative attitude on the part of the British the Eighth Air Force found encouraging in itself, for it was absolutely essential to the success of any combined campaign that the two partners should work together without friction, each possessed of a substantial faith in the other's doctrines and equipment. General Spaatz was keenly aware of this fact. After the first week of operations he reported confidently that the American air forces had demonstrated that they could conduct

operations in close cooperation and harmony with the RAF. And, somewhat later, he expressed concern over what he believed to be an increasing habit among Americans of belittling the RAF and its bombing effort. Without underwriting everything done by the British, he pointed out that they were in a position to speak with authority on bombing operations and that, in point of fact, the RAF was the only Allied agency at the time steadily engaged in "pounding hell out of Germany."<sup>59</sup>

### *Limiting Factors*

If, as General Eaker said, both the RAF and the Eighth Air Force were more cheerful over the daylight bombing offensive "than had been thought possible a month ago," many problems had yet to be faced before that offensive could be declared a success or, indeed, before it could be given an unquestioned place in the military scheme of things. Some of these problems could be solved, others could at best be only borne with hopefully and patiently: together they contributed an undertone of solemn seriousness to the chorus of official optimism. Among those which might presumably be solved in time was that of training; but it was still a major problem. The 97th Group had begun operations with inadequate preparation, and the new groups as they arrived in the United Kingdom and became operational found themselves in little better position. For want of time, none had been fully trained before leaving the States. Weather in the British Isles discouraged training in high-altitude flying, and facilities were lacking there for conducting realistic practice in aerial gunnery. The result was that much of the training in high-altitude flying, in high-altitude bombing, and in aerial gunnery had to be done on combat missions against a real enemy. Once combat operations had been begun, the lack of an adequate flow of replacement crews made it necessary to alert the same men on every mission scheduled, which was normally as often as weather permitted. It was consequently hard to keep up a regular schedule of training. It soon became evident that the place to perfect aircrews and units was in the United States, not in the United Kingdom, and efforts were accordingly made to shape training in the Zone of the Interior along lines indicated by experience in the theater.<sup>60</sup>

Another problem was involved in developing U.S. fighter support for the day bombers. Although of slight immediate importance to the activities of the Eighth Air Force in the fall of 1942, the concept of

U.S. fighter support was fundamental to the notion of a day bomber offensive. No matter how well the bombers had done in their early missions in combat with fighters, it was still regarded as a matter of the utmost urgency to provide them with as much protection for as great a distance into enemy territory as possible. It had long been axiomatic in the AAF that the primary role of American fighters in the ETO would be to escort bomber missions. To accompany missions deep into Germany it was essential to develop a suitable long-range fighter, and great things were hoped from the P-38. The priority given to TORCH for all such equipment made the operation of the fighters for the time being, however, of academic interest only, for they were virtually all withdrawn to the North African project in October. But the problem of the fighters remained one of the greatest significance for the bomber offensive from the United Kingdom.

During most of the period covered by this chapter the Eighth Air Force had an assigned strength of four fighter groups. Only one, however (the 31st, equipped with Spitfires according to an agreement between the AAF and the RAF), saw considerable action, flying 1,286 sorties prior to its removal to Africa in October and being credited with three enemy planes destroyed, four probably destroyed, and two damaged. The other three (the 1st and 14th with P-38's and the 52d with Spitfires) did not come to grips with the GAF during their short stay in Great Britain, although they flew several sorties over enemy territory.<sup>61</sup> In addition, many American pilots had been serving in Eagle squadrons with the RAF. These units, equipped with Spitfires, were formally taken over by the VIII Fighter Command on 29 September 1942 and organized into the 4th Fighter Group.<sup>62</sup>

The Spitfire pilots, though operating some aircraft (the V-B) which were inferior to the FW-190, went into combat with confidence in their planes.<sup>63</sup> The situation was not nearly so simple with the P-38. The RAF did not at first like the P-38. As in the case of the American bombers, early showings in the United Kingdom had been unfortunate. When, however, certain modifications had been effected, the P-38 became potentially as good a plane as any in the theater, a fact which the British themselves admitted.<sup>64</sup> Yet suspicion of the P-38 still lurked among the U.S. pilots, fostered in part by hearsay and in part by a couple of bad accidents involving improperly manipulated power dives.<sup>65</sup> Only actual combat experience was likely to dispel doubts in both AAF and RAF minds.

General Spaatz was therefore very anxious to get the P-38's into action as soon as possible without committing them prematurely. Any fighters that went out over enemy territory ran the risk of tangling with the best of the German Air Force pilots; so it was necessary to give the Lightning pilots careful training in cross-Channel flights before sending them into a real battle.<sup>66</sup> Bad weather and mechanical failures delayed their entry into combat, but after 16 September they became fully operational and flew on several missions before being removed to the North African project in October.<sup>67</sup> Their contact with the enemy was slight, however, and no conclusions could be drawn. As of 14 September the four fighter groups of the VIII Fighter Command were transferred to the XII Fighter Command for shipment to North Africa. They continued to operate under the VIII Fighter Command until 10 October. Only the 4th Group, consisting of former Eagle pilots, remained in the United Kingdom.<sup>68</sup> It was many months before a significant force of AAF fighters was able to operate regularly from the British bases.

The development of a self-sufficient U.S. fighter force may have been essential to the plan of 8 September for the day bomber offensive, but it was not essential to the immediate prosecution of the campaign itself. If the basic fighter units were removed for TORCH, RAF units remained to provide cover for the American bombers. But TORCH constituted nevertheless a threat to bombing operations from the United Kingdom, the gravity of which can hardly be exaggerated. Immediately that TORCH was approved, it became evident that preparation for the North African operation would for an indefinite period take priority over all other air activities in the United Kingdom. On 8 September, General Spaatz issued specific orders to this effect, and although the order was rescinded a few days later, it appeared for the time being that tactical operations of the Eighth Air Force, including combat missions, would be completely suspended.<sup>69</sup> Each command in the Eighth Air Force and each section in its headquarters was given responsibility for processing corresponding agencies in the new Twelfth Air Force. In addition to the four fighter groups contributed directly to the Twelfth, the older air force was scheduled also to lose two heavy bombardment groups (the 97th and 301st) after the first week in November and two more at a later date.<sup>70</sup>

Thus the drain on the combat strength of the Eighth Air Force caused by the TORCH operation was both direct and indirect. The



loss of two groups would reduce the heavy bomber strength by one-third—and combat effectiveness by an even larger proportion, since these were the two oldest and most experienced bomber units in VIII Bomber Command. The indirect effect involved in processing the Twelfth Air Force units was even more devastating. As General Eaker stated on 4 January 1943, VIII Bomber Command staff offices had been devoting half their time to supervising the training, supply, and maintenance of XII Bomber Command. The combat crew replacement center, from which combat units were supposed to draw necessary replenishment, had given first priority to the TORCH units which had to be built quickly up to strength.<sup>71</sup> The Twelfth Air Force also enjoyed priority in organizational equipment, spare parts, and aircraft replacements; and the VIII Air Force Service Command was spending by far the greater part of its effort on the TORCH units, in addition to contributing large numbers of trained men and quantities of equipment.<sup>72</sup> As a result, servicing and maintenance for VIII Bomber Command aircraft became slow and uncertain, preventing the most effective employment of such bombers as were on hand and increasing the likelihood of abortive sorties. Faced with shortages in almost every category, the VIII Bomber Command ground crews often had to resort to “cannibalism”—the dismantling of damaged aircraft, dubbed “hangar queens.” It was the opinion of some group commanders that if crews had not shown extreme energy and ingenuity in this regard at least half of the bombers maintained on operational status would have been out of combat.<sup>73</sup> The VIII Fighter Command had been assigned the specific task of dispatching units to Africa, and this effort, in addition to the loss of four out of five groups, promised to render it practically useless as far as operations from the United Kingdom were concerned until the movement had been completed.<sup>74</sup>

Almost more depressing than the demands of TORCH to those whose duty it was to keep up a bombing offensive from the United Kingdom was the weather in that region. Unlike TORCH, this handicap was to be recurrent. Favorable weather was an absolute prerequisite to successful day bombing, at least until more efficient methods of blind bombing had been discovered than any yet developed. It had been with the full knowledge of this fact that the USAAF had projected its scheme for a day bombing offensive from the United Kingdom. But the weather in the fall of 1942 seemed—and British observers claimed that it was—unusually bad.<sup>75</sup> Fewer operational days had

turned up in September than had been hoped for, and as October progressed, the situation only grew more disheartening.<sup>76</sup>

By early October it was seriously debated whether it was feasible to conduct a full-scale offensive of this sort from British bases, especially in view of the fact that a successful North African campaign might be expected to open up a very attractive alternate base area in that quarter. To offset such a defeatist attitude General Eaker wrote on 8 October that weather should not cause too much alarm. There were, he maintained, five to eight days in every month favorable to maximum effort at high level, which was about all the current rate of replacements would allow in the best of circumstances. This represented a more cautious estimate than that of ten missions a month made in August, but General Eaker hoped to keep the enemy from resting during the interim periods of relatively bad weather by developing a highly trained and skilled intruder force, capable of employing bad weather as a cloak for small blind-bombing operations.<sup>77</sup> Plans were in fact already made for these "moling" missions which, it was hoped, by the use of the most advanced navigational and bombing devices, would make it possible for single B-24's to keep enemy air raid systems and defensive establishments on the alert and so interrupt enemy industrial production.<sup>78</sup>

What bothered the Eighth Air Force commanders most about both the diversion to TORCH and the bad British weather was that, for a successful day bomber offensive, time was of the essence; and on both counts vital time seemed likely to be lost. Every month of delay in mounting a full-scale offensive against German industry gave the enemy just that much time in which to redeploy his forces and to readjust his techniques to counter the Allied attack. So far the GAF had reacted to the daylight attacks of the Eighth Air Force with less alacrity and with less deadly effect than had been generally anticipated. The GAF kept barely one-fourth of its total day fighter strength on the western front during the fall of 1942, preferring to concentrate its forces on the two land fronts in Africa and Russia. Furthermore, it showed no signs of reinforcing the fighters on the western front, even after the pattern of Eighth Air Force bombing activity had become evident and its seriousness at least partially appreciated. By the end of the year the German fighter defenses in the west were still deployed in a relatively thin line from Norway to Brittany, with some concentration in the Pas de Calais area and in Normandy, both of which areas de-

fended, among other things, the route to Paris. Nor had it been too difficult for the daylight bombing missions to avoid disastrous concentrations of enemy fighters. Although the high-level bombing mission was, almost from its time of take-off, an open secret to the German radar detectors, it had been possible by diversionary sweeps and deceptive measures to confuse the enemy as to the identity and size of the main attacking force. Medium bomber attacks accompanied by fighter sweeps had generally succeeded in drawing off a number of German fighters that might otherwise have tangled with the heavy bombers. And a radio countermeasure known as "moonshine," employed by a small force of RAF Defiants in order to make themselves appear to German controllers as a large heavy bomber formation, worked very well as an evasion technique until November 1942.<sup>79</sup>

These facts seem to have made the task of penetrating enemy fighter defenses look deceptively easy to American observers. To some it appeared possible that the day bombers might after all be able to penetrate German fighter defenses without their own fighter protection. It was strongly suggested in Washington that the GAF was actually on the wane, that the fighting on the land fronts, coming on top of the earlier air action in the west, had forced the enemy to cut heavily into its stored reserves in order to maintain its front-line strength.<sup>80</sup> This estimate, though since shown to be in error, was not without justification for it was not until 1943, after the strategic day bombing by the Eighth Air Force became an unmistakable threat, that the German high command undertook seriously to build up the total GAF fighter force or to redeploy it to strengthen the western front. Even if true, of course, a decline in the strength of the GAF would in itself have been a strong argument for pressing the attack before the enemy could rebuild his forces. Beneath this optimism, however, lay a sober respect for the resiliency and intelligence of the GAF. The Germans had it in their power to do either of two things: they could increase their production of fighter aircraft, at the expense of other types if need be,<sup>81</sup> or they could build up a strong force of heavy bombers in order to strike back at the British cities. In either case, time would be required to reorganize production. One of the alternatives seemed, however, inevitable; and it occurred to General Spaatz that the Germans might well profit by the lessons in daylight bombing delivered so recently and convincingly by the Eighth Air Force. By adding firepower and armor to their four-engine FW-200's they might act against the United King-

dom before the American forces could exploit their current technical advantage. "Daylight bombing," he wrote on 16 September, "with the same accuracy as we have gotten and with the same casualty ratio in air fighting would raise hell with this island. We must hit their aircraft factories before Spring and it requires a large number of B-17's to attempt this."<sup>82</sup>

Thus the picture presented by the day bombing offensive just after the mission against Lille on 9 October was one of sharply contrasting lights and shadows. During the rest of the month the shadows tended, in a sense quite literally, to lengthen. On the 25th, General Arnold requested a full explanation of the small number of missions recently carried out. The answer merely recounted the problems and obstacles that had been faced increasingly during the previous weeks: the weather, the demands of the TORCH movement, and the inadequate training status of the remaining units.<sup>83</sup> Owing to unfavorable weather, only one mission had been accomplished since 9 October.<sup>84</sup> The RAF reported that no reconnaissance photographs of any value had been turned over to its bomber command since the middle of September as a result of the consistently poor visibility.<sup>85</sup>

By 1 November, too, the inroads made by the Twelfth Air Force on the strength of the older organization had become more apparent. In addition to four fighter and two heavy bomber groups, the Eighth Air Force had turned over trained personnel to the extent of 3,198 officers, 24,124 enlisted men, and 34 warrant officers, of whom 1,098 officers, 7,101 enlisted men, and 14 warrant officers came from the VIII Bomber Command alone.<sup>86</sup> The remaining heavy bombardment groups (the 44th, 91st, 92d, 93d, 303d, 305th, and 306th) suffered considerably from loss of such essential equipment as bomb-loading appliances and transport vehicles. They suffered even more from the complete lack of replacements, both crews and aircraft, a fact which made it impossible to keep a large force in the air even when weather conditions permitted; and no prospect was in sight of receiving any during November.<sup>87</sup>

Of the heavy bombardment groups scheduled to be left in the United Kingdom (five groups of B-17's and two groups minus one squadron of B-24's), only two were by the end of October in fully operational status.<sup>88</sup> It had been found necessary to give two to three weeks' extra training to all new units in formation flying at high altitude, in radio operation, and in aerial gunnery. And even as the crews

gained in experience it was the policy of the Eighth Air Force to send them out only in circumstances for which their state of training had made them fit. General Eaker believed that nothing could be gained by dispatching green units when conditions of weather or enemy defenses would only cause inordinate loss. For the same reason it was not thought wise to undertake missions that would require landing or take-off in darkness, an attitude which seriously limited the time available for operations during the short fall and winter days.<sup>89</sup>

Furthermore, the scope of Eighth Air Force missions had been restricted to a relatively narrow area in occupied France and the Low Countries which could be reached in a short time, with the bombing formation exposed to attack only for brief periods, and which, presumably, did not as yet possess such strong defenses as might be expected in Germany proper. Unfortunately, this otherwise necessary restriction prevented the bomber command from making use of occasional streaks of fine weather over more distant targets and over Germany proper at times when France and the Netherlands were completely closed in. Restrictions in the area and time of attacks simplified the GAF's problems of defense.

It was confidently hoped that a force of sufficient size and training to saturate enemy defenses would remove many of the limitations. Such a force would permit deeper penetrations into Germany and a consequently wider choice of weather conditions. General Spaatz hoped it would also allow operations at lower altitudes beyond the range of the fighter escort, with a consequent increase in the effectiveness of the attacking force.<sup>90</sup> Given a force of 300 heavy bombers flown by trained crews, General Eaker believed he could attack any target in Germany by day with less than 4 per cent loss. Smaller numbers would naturally suffer more severely. Despite all problems and currently effective limitations, he stoutly maintained that "daylight bombing of Germany with planes of the B-17 and B-24 types is feasible, practicable and economical."<sup>91</sup>

Meanwhile it was a question either of committing valuable crews and aircraft prematurely to operations over heavily defended territory and in bad weather or else of proceeding cautiously as training status and rate of replacements would permit effective operations of wider scope. General Eaker preferred the latter alternative, for to adopt the former would be not only to incur crippling losses but to ruin "forever" the "good name of bombardment."<sup>92</sup>

It would [he wrote to General Stratemeyer somewhat earlier in October] have been very easy for us to commit the force in such a way that improper conclusions would have been drawn from day bombardment. We knew the critical aspect of our task and the fact that it might affect the whole future of day bombardment in this war. . . . The way we are doing it we are going to draw conclusions—some have already been drawn—which will be entirely favorable to the power of bombardment. Please do not let anybody get the idea that we are hesitant, fearful, laggard or lazy.

In other words, these early missions were less important for what they contributed directly to the Allied war effort than for what they contributed indirectly by testing and proving the doctrine of strategic daylight bombing. In either instance it was as difficult and dangerous to strive for quick results as it was natural for observers, especially those at some distance from the scene of operations, to look impatiently for them.

### *New Directives*

On 20 and 29 October 1942, Eighth Air Force received two significant directives governing the scope of its operations and the priority of its targets. The directive of 20 October, issued by General Eisenhower as theater commander and acting as agent for the CCS in the matter of bombing policy, did nothing more than the directives issued during August to clarify the strategic policy underlying the daylight bombing operations—its relation, for example, to a joint British-American offensive such as had been adumbrated in the Joint Directif of 8 September. It did, however, reflect the immediate urgency of TORCH as the currently important item of Allied strategy.

In order to move the huge amounts of men, supplies, and equipment from the United Kingdom to North Africa, it was necessary to protect that movement from both submarine and aircraft attack. Accordingly, General Eisenhower required the Eighth Air Force, as a matter of first priority, to attack the submarine bases on the west coast of France from which the major portion of the German Atlantic U-boat fleet operated: Lorient, St. Nazaire, Brest, La Pallice, and Bordeaux. Secondary targets for missions against the above bases would consist of shipping and docks at Le Havre, Cherbourg, and St. Malo. In second priority came the aircraft factories and repair depots at Meaulte, Gosselies, Antwerp, and Courcelles and the airfields referred to as Courtrai/Wevelghem, Abbeville/Drucat, St. Omer/Fort Rouge, Cherbourg/Maupertuis, Beaumont/Le Roger, and St. Omer/Longuenesse.



Transportation targets and marshalling yards in occupied countries were left in third place.<sup>93</sup>

This directive committed the Eighth Air Force for the immediate future to the support of TORCH. By naming enemy submarine bases as targets of first priority it also committed the Eighth indefinitely to strategic bombing of an essentially defensive order in place of the direct offensive attack on the industrial vitals of the German war machine. The increasing submarine menace threatened the entire logistical plan for Allied operations in Europe and Africa. It constituted Germany's most powerful weapon against the Allies' ocean-borne forces and supplies. It had, as a result, featured conspicuously in Allied strategic planning during the fall of 1942. The early directives issued to the Eighth had all included submarine targets. On 13 October, General Eisenhower informed General Spaatz that he considered the defeat of the submarine "to be one of the basic requirements to the winning of the war." He appreciated the importance of striking the GAF but, as he made clear in subsequent discussions, that objective must be considered as an intermediate one, something that must be dealt with in order to get at the primary objective which must be the enemy submarine fleet—at least for the duration of the North African operation.<sup>94</sup> It was a new point of view for the Eighth; earlier plans had called submarine installations—like the Luftwaffe—an "intermediate" objective.

Conferences between American and RAF commanders resulted in general agreement that, inasmuch as the British bombing force could not operate against bases in the Bay of Biscay during daylight hours owing to limitations of equipment and since night bombing of such targets would be ineffective, they should be left to the daylight bombers of the Eighth Air Force. Meanwhile, the RAF Bomber Command would operate against submarine manufacturing centers and other allied installations in Germany itself. Spaatz and Eaker were both confident that their heavy bombers could do the job. It would, of course, involve penetrations beyond the range of fighter protection, but experience to date with enemy fighters had been encouraging. Still, relatively heavy casualties would have to be accepted; and heavier losses would probably postpone seriously current designs for bombing Germany proper.<sup>95</sup>

On 29 October, the Eighth Air Force received still another directive, this time regulating its missions against targets in occupied countries. The problem with which this paper dealt was a delicate one. Objectives

vital to Germany's war effort existed in occupied France and the Low Countries, and it had been a point of tactical policy to restrict American bombing effort to these areas. But it was impossible, even with greater precision than the U.S. bombers were as yet capable of, to insure the safety of civilians and their property in the neighborhood of the targets. Thus, there arose a political problem which threatened radically to affect bombardment plans.

In an effort to prepare the French population, some warning had been given by radio. On 7 October 1942, two days before the Lille raid, the British Broadcasting Company included in its broadcasts to Europe a message of warning from the American high command. AAF bombing, it stated, was aimed only at Nazis and those activities in France and other occupied territory which helped support the German war effort. It advised all French people living within two kilometers of factories supporting the German war machine to vacate their homes, since bombing small targets from great altitudes would doubtless be attended by some inaccuracy. Targets especially liable to attack were factories manufacturing or repairing aircraft, tanks, vehicles, locomotives, firearms, or chemicals. Railway marshalling yards, shipyards, submarine pens, airdromes, and troop concentration centers were also likely to be bombed.

French opinion had nevertheless been deeply stirred as a result of the bombing at Rouen, at Lille, and again at Lorient, in each of which civilian French casualties had been distressing, if not always extremely numerous; at Rouen some 140 were killed, at Lille approximately 40, and at Lorient a few Frenchmen were numbered among the 150 dead, more than half of whom were Germans, the rest Belgian and Dutch.<sup>98</sup> Naturally the French viewed the bombing of their cities with mixed emotions, the mixture varying pretty much with the severity of their own losses. Although generally happy in a grim sort of way to see any damage dealt the Nazis, even in their own land, many Frenchmen found it hard to take a long-term view of the situation when American bombs fell on French property and took French lives. The Germans leaped at this opportunity to poison French minds against the Allies, covering walls with posters which featured the civilian deaths and civilian sufferings attendant upon the American bombing. The controlled press did its best to keep the bitterness alive. Even those who understood the strategic necessity for the Allied bombing felt that, in planning such missions, the sorrow and destruction suffered by the

French should be carefully weighed against the doubtful results to be attained from bombing at extremely high altitudes. It was on this point that most French criticism seemed to be concentrated in the fall of 1942. French observers could not help believing that as long as bombing attacks were made at 25,000 feet only a small percentage of bombs were likely to hit the target; and results had not as yet been such as to persuade them to the contrary.<sup>97</sup> Some also urged, apparently quite seriously, that bombing of factories and shipyards should be done only on Sundays and holidays when French workmen would be absent.<sup>98</sup>

It was in an effort to bring up to date a code of rules for operations in this delicate but unavoidable situation that the Air Ministry, to whom the responsibility for such political matters was customarily left, issued the directive of 29 October. Bombardment was to be confined to military objectives. The intentional bombardment of civilian populations, as such, was forbidden. It must be possible to identify the objective. The attack must be made with reasonable care to avoid undue loss of civilian life in the vicinity of the target, and if any doubt existed as to the possibility of accurate bombing or if a large error would involve the risk of serious damage to a populated area no attack was to be made. The provisions of Red Cross conventions were, of course, to be observed. Military objectives were defined broadly to include any sort of industrial, power, or transportation facility essential to military activity. The only other important restrictions were against attacks on passenger trains during daylight hours and on power stations in Holland, the destruction of which would cause extensive flooding of the land by putting out of action electrically driven pumps. Special consideration was to be given to the Channel Islands, should attacks on enemy installations there become necessary. In conclusion, the directive stressed that none of the foregoing rules should apply in the conduct of air warfare against German, Italian, or Japanese territory, except that the provisions of Red Cross conventions were still to be observed, for "consequent upon the enemy's adoption of a campaign of unrestricted air warfare, the Cabinet have authorized a bombing policy which includes the attack on enemy morale."<sup>99</sup>

The directives of 20 and 29 October regulated the operations of the American bombing force in the United Kingdom substantially for the remainder of the year. Except for the reinstatement on 21 October of the Ford and General Motors truck assembly plants at Antwerp as targets of no particular priority but suitable for attack when weather

conditions proved unfavorable elsewhere, the only major addition to the priority list was made on 19 November. On that date the U-boat construction yards at Bremen, Vegesack, and Kiel and transportation objectives at Essen and Hamm were added. This inclusion of German targets reflected the impatience of the American command to attack Germany proper rather than to continue the task, always in some degree distasteful, of bombing targets in France, Belgium, and Holland. It also reflected impatience on the part of the British Air Staff, which since early November had been showing concern over the failure of the Eighth Air Force to begin operations against the Reich. The target revision of 19 November was, however, to remain for the rest of the year a paper change only, for it was not until the end of January 1943 that the American bombers finally penetrated the Reich. Only then did the Eighth feel that it had a sufficient force adequately trained to attempt so formidable a task.<sup>100</sup>

## CHAPTER 8

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### *THE WAR AGAINST THE SUB PENS*

SUBMARINES became the primary concern of the Eighth Air Force after 20 October 1942 and continued to preoccupy that organization until June 1943. In the fall of 1942, however, it was not at all clear whether striking the submarine operating bases on the coast of France, as the directive of 20 October stipulated, was an efficient method of reducing the submarine menace; nor was it clear that the day bombers could do that job effectively. The entire anti-submarine campaign constituted, in fact, a highly controversial problem, and one in which the essential data became too often obscured by the mysterious activities of that most mysterious of the enemy services. On the basis of information no doubt unavoidably insufficient, the Eighth Air Force became committed to a protracted campaign against the submarine operating bases on the French coast, which campaign, though unquestionably inconvenient and harassing to the enemy, proved on final analysis to have had no appreciable effect on the rate of U-boat operations.\*

To those who had to cope with the steadily increasing submarine threat, several alternative courses of action suggested themselves, no one of which promised by itself to be entirely satisfactory. It would have been very natural for strategic bombing forces to have concentrated their efforts on the sources of the submarine fleet, as they planned to concentrate on the sources of the entire German war machine. The submarine construction yards and the component parts manufacturing plants provided tempting objectives, the complete destruction of which would eventually solve the U-boat problem. The RAF had

\* See below, pp. 251-54.

already expended a not inconsiderable and sustained effort in this direction. Although few and light in the fall of 1942, British Bomber Command attacks during the fifteen months from April 1941 to June 1942 had damaged the ports of Rostock, Lübeck, and Emden and had dealt heavy blows to facilities at Bremen, Hamburg, Wilhelmshaven, Kiel, and Bremerhaven. In addition, the submarine Diesel factory at Augsburg and the component parts factories in Cologne had suffered in the attacks on those cities.<sup>1</sup>

The British effort had, however, been directed primarily against the towns themselves rather than against the port facilities and factories, in accordance with the RAF policy of area bombing. It was the opinion of the Ministry of Economic Warfare in July of 1942 that, apart from damage to the plant at Augsburg which was supposed to be producing up to 50 per cent of the total submarine Diesel engine requirements, little severe damage had been inflicted on component factories. In that instance, it estimated, probably one month's output had been lost, amounting to the Diesel requirements for ten submarines. As for the construction yards, repeated attacks on Wilhelmshaven, Kiel, Hamburg, and Emden had resulted in no detectable decrease in U-boat production, although the estimated schedule appeared to have been delayed by a few weeks as a result of a variety of factors, not all of which could be identified with the bombing offensive. This same agency further contended that these objectives were not well suited to aerial bombardment. Component parts plants were numerous, widely scattered, often inaccessible from the United Kingdom, hard to identify, and of a type difficult to destroy except by attacks of "exceptional weight and concentration." Moreover, it was reported that a surplus of suitable productive capacity existed. The shipyards presented targets too small, too isolated from other suitable objectives, and of a type not easily enough put permanently out of action to warrant a major share of the bombing effort. On the other hand, their proximity to the British air bases made them always useful secondary objectives.<sup>2</sup>

The increased accuracy possible with precision bombing by day promised greater effectiveness in attacks on targets of this nature. But even so, there was little hope of an immediate effect on submarine operations. It was estimated in August 1942 that the submarine fleet consisted of some 240 operational craft, with 120 training in the Baltic. Production at that date was believed to be in the neighborhood of twenty per month, ten to fifteen a month becoming operational; and



sinkings by Allied agencies were currently at the rate of from five to seven a month. It appeared, therefore, that no amount of damage done to the submarine construction yards and factories could reduce the operating fleet during the ensuing nine months; indeed, it was anticipated that accessions from the force in training would add to the fleet eight to ten U-boats each month during that period.<sup>3</sup> Bombing attacks on production facilities could have only a long-term effect on operations, and in the fall of 1942 the Allies were in no position to wait until the U-boat fleet perished from attrition.

With plans for the opening of an African campaign in November, the element of time became of the most urgent importance. If the Allies were effectively to supply the United Kingdom, the Middle East, and North Africa, it was clear that something drastic would have to be done for the restriction of enemy submarine operations,<sup>4</sup> and one of the more favorable opportunities seemed to be offered by the enemy's operating bases on the western coast of France. The Germans had begun, immediately after the defeat of France, to develop facilities at Brest, Lorient, St. Nazaire, La Pallice, and Bordeaux in order to place the submarines as close as possible to Atlantic supply lines and as far as possible from British airfields. They had constructed elaborate pens to house and protect these craft during their stay in port and had built extensive repair and servicing facilities. Elaborate also was the schedule of turnaround by means of which a limited number of pens could be made to accommodate a large and growing fleet of submarines.<sup>5</sup>

Since the middle of 1942 the RAF Coastal Command had concentrated a considerable part of its antisubmarine forces in patrols over the Bay of Biscay. Practically all units of the Atlantic submarine fleet had to pass through the Bay of Biscay on the way to and from their French bases, and there thus existed a constantly high concentration of submarines in the bay and its approaches. By covering this transit area with long-range aerial patrols, Coastal Command hoped either to destroy a significant number of submarines by direct attack or, by forcing them to remain submerged for long periods, to reduce substantially their effective time in the open sea. As yet, the effort suffered from lack of enough long-range aircraft, lack of a "balanced" antisubmarine force capable of attacking both by day and night, and lack of adequate radar equipment and special weapons. Actual "kills" had been relatively few,<sup>6</sup> but great hopes had been placed in an increased and improved Bay of Biscay offensive.

A logical development of that offensive was the employment of Eighth Air Force bombers against the enemy's operating bases. It was considered practically impossible to penetrate with any bombs then available the dozen or more feet of reinforced concrete that formed the roof of the U-boat pens.<sup>7</sup> But it was believed that the facilities at these bases were so integrated, and the time schedule for repair and refitting so carefully adjusted, that any damage to the installations surrounding the pens would cause serious delay in turn-around and so, in effect, reduce the number of submarines in operation. Locks, floating docks, storage depots, railway yards, powerhouses, foundries, barracks, and submarines not actually in the pens all appeared to present vulnerable targets for bombing aircraft—especially for bombers equipped for precision operations.<sup>8</sup> It was considered very probable that much of the servicing had been put under concrete along with the submarines themselves and that alternative power installations existed which could be used to relieve most emergencies affecting the power system. It was certain that the bases would be given powerful antiaircraft protection.<sup>9</sup> Yet the prospect of disorganizing the U-boat campaign by harassing attacks on vital points, and eventually of neutralizing them, seemed reasonably bright.<sup>10</sup> General Eaker in October expressed confidence that, given ten heavy bombardment groups, the VIII Bomber Command could effectively deny to the enemy the use of five Biscay bases.<sup>11</sup> The Air Ministry in August had declared itself in favor of operations against the U-boats at sea and against their operating bases, in preference to the long-term policy of attacks against building yards and factories.<sup>12</sup>

Opinion in Washington was divided on the use of long-range, land-based aircraft in antisubmarine operations. The U.S. Navy favored extended convoy cover as the most effective use of this type of plane, but it also had advocated air attack on the operating bases as a helpful auxiliary measure.\* Those actively identified with the AAF Antisubmarine Command argued for employing as many B-24's as possible on such projects as that already being conducted by the RAF Coastal Command in the Bay of Biscay. But Brig. Gen. C. W. Russell, AAF coordinator for antisubmarine activity, on 3 November placed primary emphasis on attacks against the operating bases and construction yards by heavy bombers of the Eighth Air Force, a policy which AC/AS, Plans indorsed.<sup>13</sup>

\* See below, chap. 12,

The choice between operating bases and construction yards as targets for Eighth Air Force operations was for the time being simple enough. A campaign against the French bases was especially well suited to the capabilities and limitations of the American bomber force. Not only were the targets much better adapted to daylight precision methods than to those of the RAF night bombers, they were also within the area of occupied France to which Eighth Air Force operations had been temporarily restricted. Accordingly, General Spaatz pledged the maximum use of his force against the U-boat bases. At the same time, he made available to Coastal Command twelve B-24's to help cover the movement of shipping to Africa by expanding the system of long-range air patrols over the sea lanes.<sup>14</sup>

### *The German Submarine Bases*

The VIII Bomber Command flew its first mission against the submarine bases on 21 October, when it dispatched ninety bombers (sixty-six B-17's and twenty-four B-24's) to attack the enemy base at Lorient-Keroman. The objective was a small fishing port, situated about one and one-half miles southwest of Lorient on the Brest peninsula, which the Germans had developed as a major submarine base. Principal targets were the U-boat shelters: twelve completed ones and a block of seven pens then under construction. Typical of their kind, these shelters had been built on dry land, then connected with the harbor by channels, and provided with heavily reinforced concrete roofs. Immediately adjacent to the pens stood lighter and smaller buildings believed at that time to contain workshops, transformers, oil storage, offices, and other installations directly connected with the servicing of U-boats. Lorient had not been attacked by the RAF during 1942, nor had the British ever attacked the area of the submarine pens. In 1941 they had made thirty-three night raids, dropping 396.1 tons of bombs, mainly on the town itself.<sup>15</sup>

Though bad weather on 21 October forced all but fifteen B-17's of the experienced 97th Group to turn back before reaching the target, the bombing was unusually good. From a 17,500-foot altitude—a considerable departure from the 22,000- to 27,000-foot level usually reached—the bombers dropped thirty high-explosive bombs, each weighing one ton. With the exception of a few which fell some 1,100 yards from the pens, most of the bombs fell in the immediate target area. Of the thirty dropped, twenty-one fell within a radius of 1,000

feet from the aiming point.<sup>16</sup> Five bombs were reported by ground observers to have hit the central block of shelters; but, according to a French underground informant, they did not penetrate more than five feet despite their weight. Among the surrounding buildings, the results were somewhat better. Three general workshops and a pair of floating docks were pretty thoroughly destroyed and two submarines were damaged by blast. Of the 150 reported killed, more than half were German workmen and about 40 were French.<sup>17</sup>

Although little major damage was done to the base itself, the bombing made a great impression on both French and German opinion. For once, the French people appear to have compared an attack by U.S. forces favorably with those made by the British. They seem to have been greatly pleased with the whole affair, standing in the streets, watching and smiling and applauding the accuracy with which the Americans dropped bombs on the German installations. It was, they felt, too bad that Frenchmen had also to be killed, but the victims had asked for their fate in accepting employment at the base for the sake of the high wages paid there. As for the Germans, they appear to have been taken completely by surprise. The alarm was not sounded, and the bombs had fallen before the antiaircraft guns went into action. The Germans were said to have been convinced that a formation of such size—fifteen aircraft—could only have been their own planes. The mission temporarily discredited the Quislings, who had insisted that Allied attacks were being made deliberately against the civilian French population and that the base was too well defended to be attacked. The controlled press remained silent.<sup>18</sup>

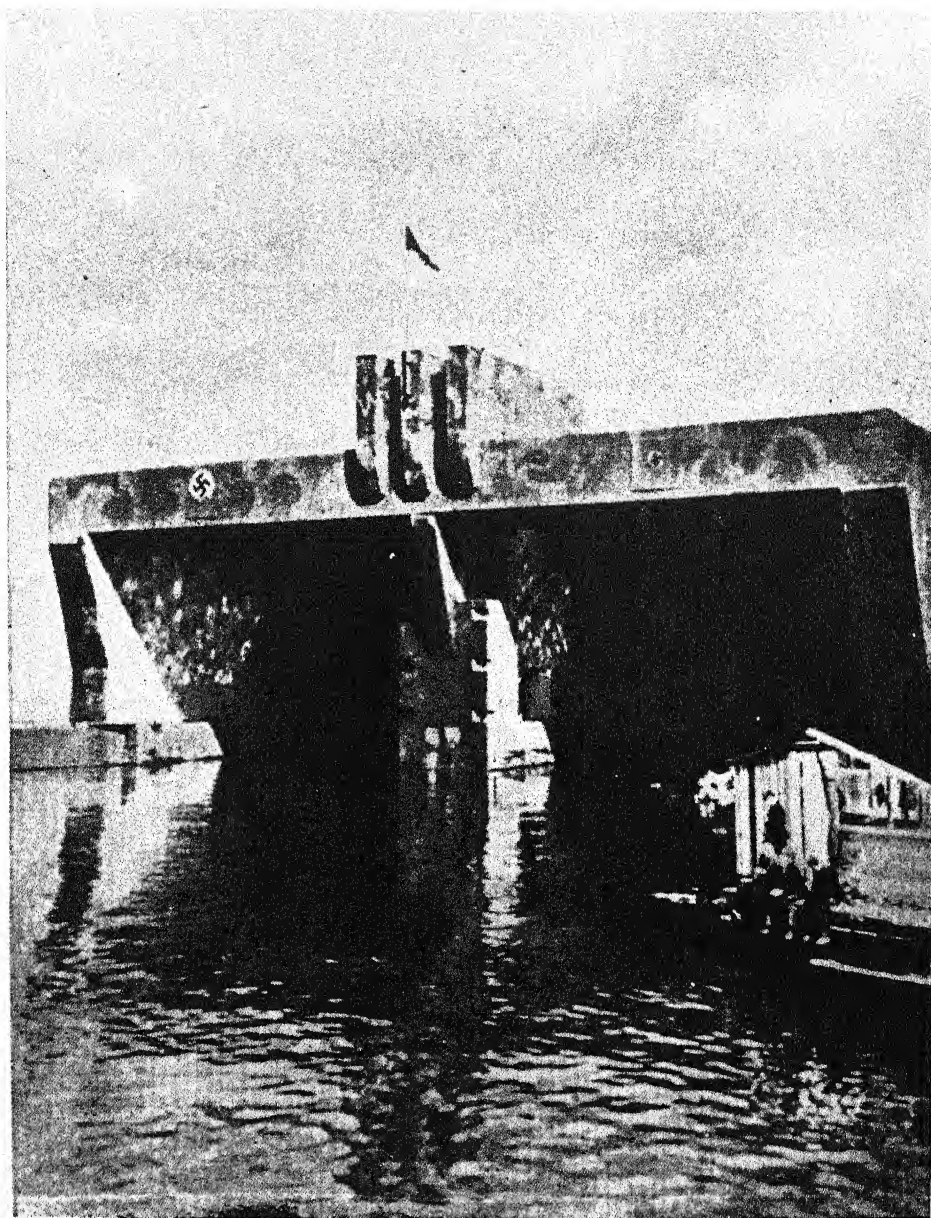
Despite the fact that the defenses at Lorient were caught napping and although the attacking force encountered no effective flak, they did run into stiff resistance from enemy fighters. As the formation crossed the enemy coast en route to the target, it met thirty-six FW-190's which gave it continuous battle to a point not far from the objective. The bombers acquitted themselves well but lost three of their number.<sup>19</sup>

With this mission and these losses in mind, General Spaatz wrote in pessimistic vein to General Arnold on 31 October: "Whether or not these operations will prove too costly for the results obtained remains to be seen. The concrete submarine pens are hard, maybe impossible nuts to crack." "However," he added, "the bombing of the surrounding installations should seriously handicap the effective use of the

bases."<sup>20</sup> General Spaatz had, in fact, undertaken this task with more determination than relish or optimism. It was not only a regrettable, if necessary, diversion of effort from the main mission of his force; it was also a job that would probably require the use of tactics very different from those for which his units had been trained. As early as 15 September 1942 he had expressed concern over this problem. Assuming that the pens themselves would be virtually impervious to normal high-altitude bombing and that they constituted the vital spot in the base installations, he predicted that if the bases were to be put out of operation some tactics in addition to ordinary high-level bombing would have to be used.<sup>21</sup>

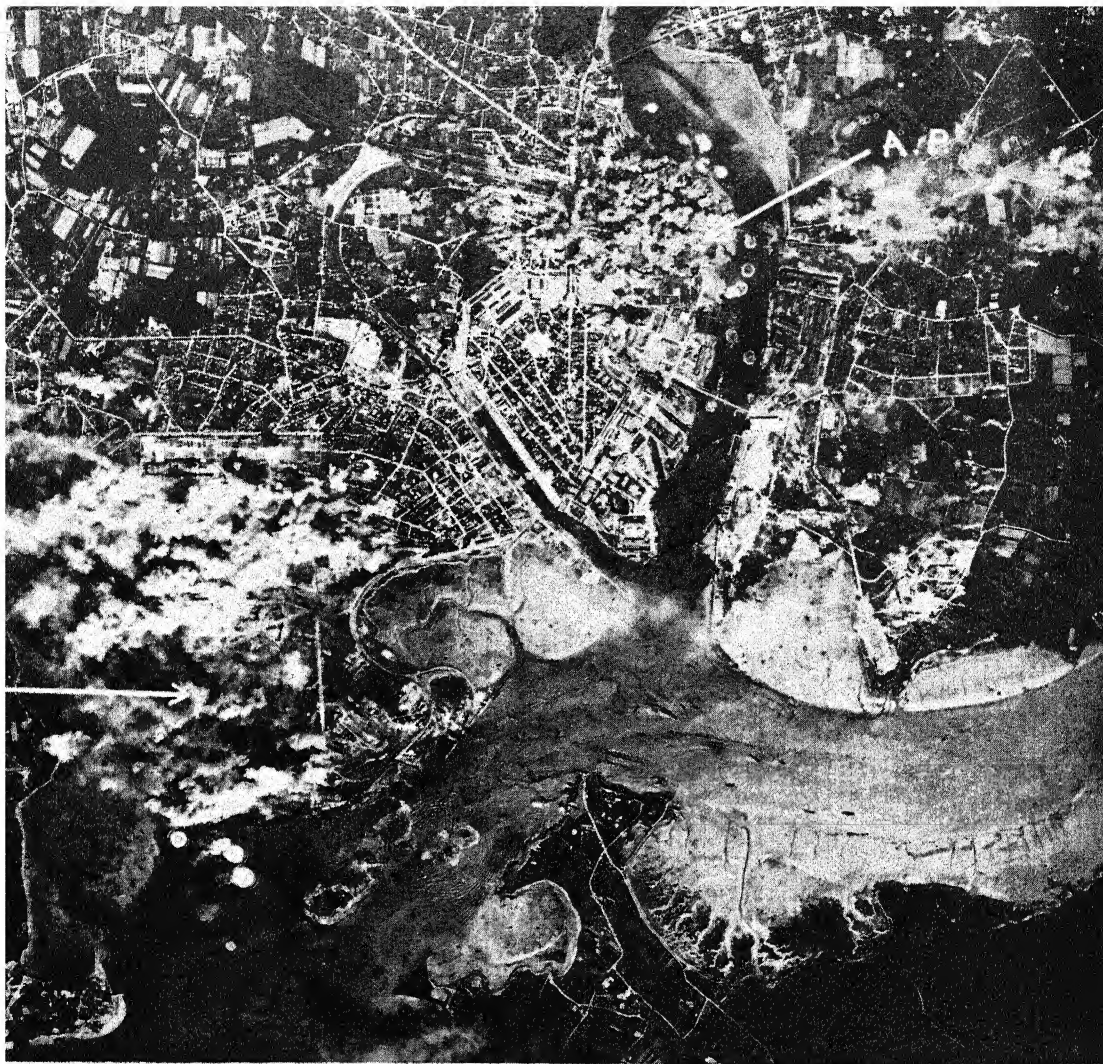
By the end of October, General Spaatz was ready to operate against the submarine bases from lower altitudes. Evidently convinced that bombing from above the 20,000-foot level, as practiced heretofore, was not likely to yield accurate enough results to neutralize small targets, he planned to operate at altitudes possibly as low as 4,000 feet. In that event, he warned, much higher casualties than any so far sustained would have to be faced, for the objectives would certainly be heavily defended by antiaircraft. Other factors, he believed, would also lead toward a higher casualty rate. Low altitudes would favor enemy fighters. Since the French bases were beyond the range of available fighter escort (no P-38's or P-47's were available), the bombers would be without fighter support over the objective. Finally, the crews left after the assignment of the 97th and 301st Groups to the Twelfth Air Force were by no means seasoned, especially the gunners.<sup>22</sup>

On 9 November the VIII Bomber Command flew a mission at very much reduced altitude against the submarine installations at St. Nazaire. If it had been seriously expected that attacks at lower altitudes would increase effectiveness without at the same time producing prohibitive losses, those hopes were effectively dampened by the experiment.<sup>23</sup> Thanks to a well-planned course and a large diversionary mission flown by the RAF, the fighter threat, heretofore the more serious, was circumvented, but the same could not be said of the antiaircraft batteries concentrated in the neighborhood of St. Nazaire.<sup>24</sup> The twelve attacking B-24's, flying at 17,500 to 18,300 feet, suffered little, but the thirty-one B-17's, flying at 7,500 to 10,000 feet, fared badly. In the neighborhood of St. Nazaire they ran into very intense flak, extremely accurate both in altitude and deflection; at 10,000 feet both light and heavy fire was reported, of considerable intensity and accuracy. As a result of this

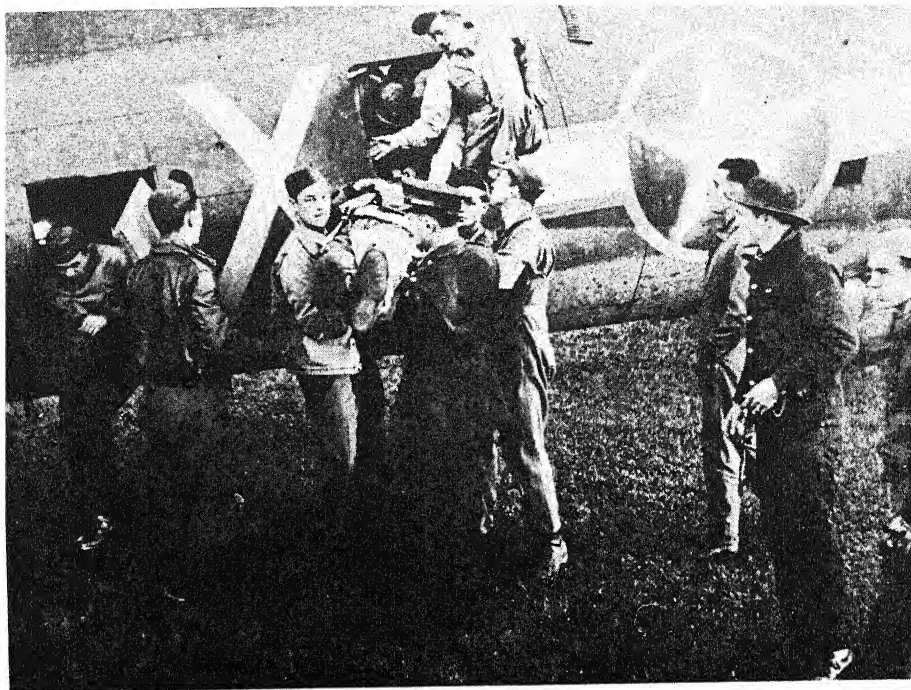


GERMAN SUB PEN, LORIENT

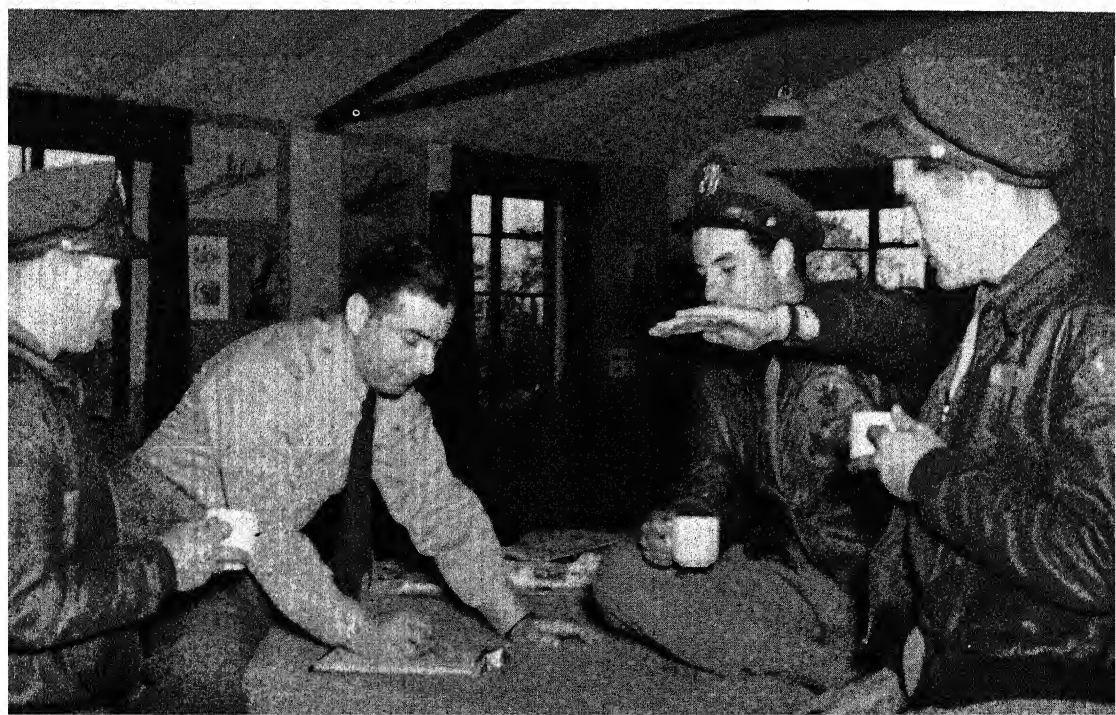




EIGHTH AIR FORCE ATTACK ON LORIENT, 17 MAY 1943



BATTLE CASUALTIES, EIGHTH AIR FORCE



barrage, three aircraft were lost and twenty-two others were damaged in some degree.<sup>25</sup>

It was a costly experiment. Flak hitherto encountered at higher altitudes had been relatively ineffective, and it was evident that the cost of low-altitude bombing could be justified only by appreciably improved accuracy. Only some 75 of the 344 bombs dropped could be plotted from strike and reconnaissance photographs, but of these, no more than 8 burst within 600 feet of either of the two aiming points—the shops of Chantiers et Ateliers de Penhouet and the lock at the entrance to the Bassin de St. Nazaire. Considerable incidental damage was done, of course, especially to rail facilities.<sup>26</sup>

This mission apparently convinced the Eighth Air Force command that attacks at low altitude would not yield results commensurate with the losses likely to result from such undertakings. Subsequent attacks on submarine bases were made at altitudes ranging from 17,500 to 22,000 feet which, at least until the mission against St. Nazaire on 3 January 1943, effectively foiled antiaircraft fire.<sup>27</sup>

Prior to 3 January the VIII Bomber Command conducted six more missions against the submarine bases, concentrating on St. Nazaire and Lorient, with one relatively light and ineffective attack devoted to La Pallice. A total of 199 heavy bombers, in missions varying in strength from 11 to 53 aircraft, attacked according to a fairly consistent pattern. They approached the target area overland across the Brest peninsula and, in order to elude enemy fighters, returned over water, skirting wide around the French coast. RAF fighter forces provided support in the form of short-range escort and diversionary sweeps over enemy territory. In no instance did the bombers enjoy fighter cover over the target area. Flak accounted for only one of their number, although in many instances it caused minor damage. On four occasions, however, the bombers encountered stiff opposition from enemy aircraft, which resulted directly in the loss of five more planes. In addition, two bombers crashed and two were lost to unknown causes.<sup>28</sup>

This over-all loss rate of less than 5 per cent of the attacking forces justified, from a defensive point of view, the decision to abandon attacks at lower altitudes. And over against these losses could be placed the damage done to the U-boat installations. By the end of December, St. Nazaire and Lorient were both showing the cumulative effect of repeated bombardment. Although the accuracy achieved still left much to be desired, enough bombs had fallen within the target areas to cause



at least serious inconvenience to the enemy. St. Nazaire suffered especially heavy damage. In the course of the five missions from 9 to 23 November, 158 aircraft dropped a total of 771,000 pounds of high-explosive bombs on or in the vicinity of the port facilities.<sup>29</sup> This damage no doubt made it more difficult to service and repair U-boats. According to an account obtained from a German naval prisoner of war, work continued after the AAF raids only in the submarine shelters which, though hit at least six times, apparently suffered no lasting damage. This same informant spoke of large-scale evacuation of the working population, which left barely enough hands to continue the restricted scale of work required in the U-boat shelters. In one shop, he said, 200 apprentices had been killed and, owing to the lack of labor to remove them, the bodies had been left in the rubble.<sup>30</sup>

The repeated attacks made by the U.S. forces at St. Nazaire in November had apparently demonstrated the virtue of concentrated effort in this type of bombing. Undoubtedly St. Nazaire, the most important of Germany's Biscay bases, had suffered heavily. But the rapid recovery of that port after 23 November appeared also to demonstrate that, if such crippling effects were to last, attacks of similar weight would have to continue at a similar rate. No mission was conducted against St. Nazaire between 23 November 1942 and 3 January 1943. During that breathing period the servicing facilities were apparently put once more into running order. British observers estimated that by 6 December the port was again in full commission. In order to retrieve the earlier successes, the VIII Bomber Command struck St. Nazaire on 3 January in the largest attack made against the submarine bases to date. Some sixty-six aircraft bombed the port, dropping 342 x 1,000-pound high-explosive bombs.<sup>31</sup>

Accuracy on this mission was better than on most of those since the first attack on Lorient. The points of burst of 107 bombs could later be identified, and of this number, 26 were located within 1,000 feet from the aiming point, in this instance a small torpedo warehouse which was hit and demolished. Considerable damage was done in the dock area.<sup>32</sup> A ground report claimed that, for the time being at any rate, the works of Penhouet had been put completely out of action. Several bombs fell on and around the submarine base itself, but none penetrated the reinforced concrete roof and, except for some windows, doors, and electrical apparatus damaged by blast inside the shelter, the base escaped serious injury and work proceeded without let or hindrance.<sup>33</sup>

Significant as the results of the bombing appear to have been, the nature of the opposition encountered during the mission gave Eighth Air Force observers even more to think about. Heavy resistance from fighters over St. Nazaire itself accounted for three of the bombers lost. In return for these losses, bomber crews were finally credited with twelve of the enemy destroyed, eighteen probably destroyed, and four damaged. But the greatest surprise came from the intensity and accuracy of the flak which, unlike that previously experienced, was thrown up in a "predicted barrage" rather than in an attempt to follow the attacking force continuously. This unprecedented fire destroyed three more of the attacking planes and hit an additional thirty-nine. In personnel, the mission cost seventy men missing, five killed, nine seriously wounded, and twenty-one slightly injured. In terms of aircraft, the cost was seven destroyed and forty-seven damaged. Although the most successful mission to date against the submarine bases from the standpoint of destruction to enemy installations, it was fully as costly as the ill-fated low-altitude attack of 9 November against the same objective.<sup>34</sup> Quite clearly, the submarine bases presented problems which U.S. bombardment experts had yet to solve.

Looking back over this first phase of the effort against the U-boat bases, leaders chiefly concerned with its prosecution could come to few conclusions regarding its effectiveness; it was easy enough to compile and quote certain operational data; ground reports and aerial reconnaissance pointed to certain specific effects which have already been summarized. But it was much more difficult to determine whether any significant number of months of U-boat operations had been denied the enemy through these operations or to what extent, if any, the American bombing attacks had affected the number of U-boats operating in the Atlantic. Information gained since the cessation of hostilities indicates that the U-boats active in the Atlantic were steadily increasing in number during the period in question.<sup>35</sup>

Opinion varied as to the extent and relative importance of the damage inflicted by the bombing. Admiralty agencies seemed to have been warmly appreciative of the U.S. attacks, if necessarily vague in specifying their reasons.<sup>36</sup> Late in November, Admiral of the Fleet Sir Dudley Pound, First Sea Lord and Chief of Naval Staff, wrote General Eaker praising the "fine achievement of the U.S. A/C employed in the precision bombing of the U/B bases in the French Biscay ports."<sup>37</sup> Generally speaking, the Admiralty recommended intensifying the day offen-



sive against the submarine bases, with concentration on the installations in the neighborhood of the pens rather than on the pens themselves.<sup>38</sup> Air Ministry and RAF Bomber Command opinion was comparatively lukewarm. A contemporary Air Ministry analysis, while granting that the U.S. attacks had undoubtedly embarrassed the enemy, placed greater confidence in direct sinkings of submarines by surface and air attack and in long-range antisubmarine air patrol in the areas where the U-boats operated. RAF Bomber Command continued to advocate the bombing of building yards.<sup>39</sup>

AAF Headquarters had other misgivings about the bombing of submarine bases. While generally elated over the fact that positive action was at last being taken against enemy installations by American heavy bombers, and although especially pleased with the fine series of attacks executed during November,<sup>40</sup> headquarters agencies felt that the weight and nature of the attacks remained unequal to the task of doing "something drastic" about the menace that still threatened Allied supply lines.<sup>41</sup> Also taken into account were the relatively high losses sustained during the last two missions—10 aircraft out of a total of 106 attacking.

Probably in an effort to allay doubts in AAF Headquarters, General Eaker had maintained a consistently optimistic tone with reference to the campaign against the submarine bases. The losses, though unfortunate, were to be expected in operations conducted repeatedly over the same objectives and in such a way that the enemy could tell by the hours of daylight and by the flight time to and from the target just when the bombers would arrive, even if their RDF had not already given fighter and flak defenses sufficient warning. Over against these losses, which were not actually prohibitive, should be placed the heavy toll taken of the enemy fighters by the American bombers. "We are still able," Eaker wrote on 2 January 1943, "and shall continue to knock down better than 6-1 enemy fighters for our bomber losses. This is, we feel, an excellent exchange." Furthermore, improved tactics might in the future be expected to better the situation materially.<sup>42</sup> The operations of November had confirmed him in the belief that with ten heavy bomber groups he could eliminate a large part—possibly 60 per cent—of the submarine menace in the Atlantic. In January he expressed the hope that as soon as it became possible for him to put 100 to 120 bombers in the air he would be able to hit submarine-building installa-

tions in Germany proper whenever weather over the Brest peninsula was unfavorable for operations against the bases.<sup>43</sup>

The U.S. Navy contributed a more conservative estimate, both of results and of prospects, and one somewhat nearer the truth as ultimately determined. A report from the naval attaché in London, for example, compared the bombing of the Biscay pens and base facilities unfavorably with other antisubmarine air operations, especially the escorting of threatened convoys.<sup>44</sup>

By January 1943, two things about the antisubmarine bombing program had become clear. In the first place, earlier assumptions regarding the imperforability of the pens were now borne out by experience. Even with the use of heavier armor-piercing ammunition it was considered doubtful whether significant damage could be done to the pen blocks. Consequently, all that could be hoped for from bombing of bases would be disorganization of the turn-around and servicing schedule.<sup>45</sup> Secondly, in order to paralyze the operating bases and so to deny them to the Germans, it would be necessary to employ much larger forces and to bomb much more frequently than had hitherto been feasible. In answer to a direct question from Washington, the headquarters of Eighth Air Force replied that to neutralize these five bases completely 250 sorties against each base per week for eight weeks would be required.<sup>46</sup> Both Air Ministry and Admiralty agreed in the necessity for increased frequency of attack by increased forces, for it was not an easy matter to inflict permanent damage on ports, as the RAF had found out at Bengasi and the Germans at Malta.<sup>47</sup>

The rest of the problem remained in the realm of opinion. Did results justify the effort expended against the submarine bases and the diversion from true strategic bombing which it involved? Was bombing of submarine bases the best use of the heavy bombers, or even a reasonably profitable way of reducing the submarine menace? These vital questions could not as yet be answered with any degree of finality. Involving, as they did, comparisons between divergent and even opposed schools of thought regarding the employment of heavy bombers, any tentative answers were unavoidably colored by the interests of the evaluating agencies. It was, however, generally recognized that no one method was likely to provide by itself the solution to the submarine problem, and opinion still gave the efforts of the Eighth Air Force a prominent, if somewhat indefinite, place in the antisubmarine campaign. The bombers may not as yet have affected the submarine situa-

tion in any major way, but they had done their job well enough with inadequate forces to make most observers believe that, properly equipped, they could do it decisively.

It was not until the end of 1943 that USAAF surveys of strategic bombing results tended to confirm doubts hitherto hesitantly expressed regarding the value of bombing submarine bases. By that time the submarine had been defeated in the first round of the battle of supply, and it had become apparent that attack from the air against the U-boat at sea had been the most effective single factor in reducing the German submarine fleet, and that bombing of bases had contributed relatively little in that direction. Grand Adm. Karl Doenitz, who, as one-time commander of the U-boat fleet, was in a unique position to know whereof he spoke, later confirmed this opinion in an interview with Allied intelligence officers after his capture in 1945. Not only were the pens themselves impervious to anything but the heaviest type of bomb, he asserted, but they housed virtually all necessary repair and maintenance facilities. Bombing of surrounding installations did not therefore seriously affect the rate of turn-around. What slowed turn-around most effectively, he claimed, was the necessity for repairing the damage done to hull structure by aerial-bomb and depth-charge attacks delivered at sea.<sup>48</sup> Undoubtedly the AAF raids caused temporary dislocations during the early months of the campaign, especially at St. Nazaire. Clearly, also, they harassed the enemy by destroying auxiliary construction plants and neighboring railway facilities and in a variety of minor ways, but these were not their primary purpose.

### *Enemy Aircraft and Transportation*

Not all Eighth Air Force effort expended during November, December, and early January was directed against the submarine bases. Those installations enjoyed, or rather suffered, first priority; and, in fact, ten of the fifteen operations undertaken by the Eighth Air Force during that period involved attacks on the five Biscay ports. But the U.S. bombers had also been instructed to strike at the German Air Force and enemy-operated transportation facilities in occupied countries as matters of second and third priority respectively. Of the 407 bombers dispatched against targets other than submarine bases, 231 were detailed to attack airdromes and 176 to bomb targets of importance to German transportation. Owing to the vagaries of the weather, which on 12 December turned a major effort against the air installations

at Romilly-sur-Seine into a minor attack on the Rouen-Sotteville yards, only 89 of the 236 planes that completed their mission dropped bombs on aircraft installations, leaving by far the heavier weight of attack for transportation. As it happened, only one target in each category sustained any considerable pounding. Three missions against Lille accounted for almost all the damage inflicted on transportation, only one other attack, the slight and ineffective one against Rouen-Sotteville on 12 December, having been executed. In the aircraft category, although planes were sent three times to the Abbeville/Drucat airdrome and once to Cherbourg/Maupertuis, only the single raid on Romilly-sur-Seine on 20 December can be classified as effective.<sup>49</sup>

At Lille the locomotive and rolling-stock repair and construction works of the Ateliers d'Hellemmes and of Fives-Lille had been damaged in the USAAF attack of 9 October 1942, but had since been extensively repaired.<sup>50</sup> They still constituted a composite objective of the utmost significance to Axis transportation chiefly because they served as the principal railway repair depot in France. RAF attacks on locomotives had created a serious repair situation. Consequently, the Lille shops were being taxed to the limit of their capacity.<sup>51</sup> It was in the hope of still further constricting this bottleneck that, on 8 November, the daylight bombers were sent again to Lille<sup>52</sup> where 30 of them dropped 293 x 500-pound high-explosive bombs intended primarily for the Hellemmes shops, which had hitherto escaped major damage. The repair shop and the machine shop both were damaged. Another attack, on 6 December, by thirty-six planes against the same target added materially to the damage already inflicted, but it is impossible to say to what extent it further retarded repair activities.<sup>53</sup> The heaviest attack against Lille came on 13 January 1943, when sixty-four heavy bombers dropped approximately 125 tons of bombs on or in the neighborhood of the objectives. As a result of this attack, repair work and locomotive construction were seriously interrupted. At Hellemmes, for example, where locomotives awaiting overhaul had been piling up since the American raid of 8 November, work appears to have come to a complete standstill for some time.<sup>54</sup>

By mid-January 1943, USAAF bombing at Lille, at St. Nazaire where the locomotive sheds had been destroyed, and at Rouen-Sotteville, combined with RAF attacks on locomotive objectives, had created a situation in which Germany no longer could regard French railway facilities—developed before the war in excess of the demands

made on them by normal traffic—as a source of reinforcements for her own overtaxed lines.<sup>55</sup>

On 20 December the Eighth Air Force made its one effective attack of the period on the German Air Force in a relatively large-scale mission against the aircraft park and repair depot at Romilly-sur-Seine. This aircraft depot and airdrome, situated near the river Seine some sixty-five miles southeast of Paris, held the reserve aircraft of all types for the German Air Force in France and the Low Countries and did much repair and re-equipment.<sup>56</sup> Of the 101 bombers dispatched on this mission, 72 bombed the target area, releasing 306,000 pounds of high explosives and 25,000 pounds of incendiaries. Results were reasonably good. Damage was inflicted on hangars, barrack huts, and aircraft, and 138 craters were made on the landing ground, 10 of them on the perimeter or taxi-tracks.<sup>57</sup> Of considerably greater historical significance, however, was the fact that, in the course of this deepest penetration yet made by USAAF planes into German-occupied territory, the bombers made contact with almost the entire force of enemy fighters located in northeast France. The ensuing air battle developed epic proportions and provided an important test of the American heavy bombers' ability to carry out unescorted missions deep into enemy territory.

Eight RAF and three U.S. fighter squadrons, all flying Spitfires, conducted diversions over areas where the German aircraft were known to be based. Enemy reaction to these efforts amounted to probably eighty-nine aircraft, but no encounters took place. In addition, 35 Spitfire IX's of the RAF escorted the bombers as far as Rouen, and 107 provided cover for them on their return trip. These operations also proved uneventful for the escorting fighters.<sup>58</sup> It was against the bomber force that the Germans concentrated the full weight of their attack. It may have been that they were prepared for just such a mission as this, for on 12 December, the date of the preceding American raid, the bombers had flown toward Romilly, intending to attack that objective, but on finding it closed in by weather they had fallen back on a target of lower priority. At any rate, the escort this time had barely turned back (at 1150 hours) when an estimated sixty German fighters, mostly FW-190's from the Pas de Calais area, attacked the formation.<sup>59</sup> They came in well above, peeled off, and closed in from the front, either slightly above, dead level, or slightly below. One B-17 of the 91st Group was observed to hit the ground at Vascœuil, and a few minutes later another B-17 from the same group began to lose altitude rapidly

with a number of enemy fighters following it down. At about 1205 hours, the enemy planes were relieved by fifty to sixty fresh fighters from Caen/Bougie, Paris, and possibly Evreux. These planes continued the fight almost to the target, which was reached between 1240 and 1245. During this phase of the battle a number of Me-109's joined in the attack, some approaching from above at 10 or 11 o'clock, flying through the formation and diving out at 3 o'clock. One B-17 of the 306th Group was hit about ten minutes before the target, but it was not until a few minutes later that it started down.<sup>60</sup>

On the return trip the bomber formation suffered almost continuous attack from fighters, most of which had apparently taken part in the earlier stages of the engagement and were now making second sorties. Two B-17's of the 306th Group went down in the vicinity of Paris. Over the Channel another bomber, the sixth to be lost on the mission, went down and was last seen smoking badly and approaching the English coast at very low altitude. In addition to the six bombers lost, two more were so badly shot up that they crash-landed in England. Twenty-nine others sustained damage in some degree.<sup>61</sup>

These losses probably all resulted from enemy fighter action, for the flak encountered proved consistently inaccurate and ineffective. The losses were heavy, and they reflected the success of the German fighter pilots in adjusting their method of attack to the peculiarities of the American bombers. It was on 23 November, during the attack on St. Nazaire, that the bomber crews had first reported a change in the direction from which the fighter passes were launched.<sup>62</sup> Hitherto, attacks had come mainly from the rear, but as the enemy discovered that the B-17's and B-24's were weakest in forward firepower, he changed abruptly to head-on attacks, which during December and January seriously embarrassed the U.S. force.<sup>63</sup>

Interrogation of crews returning from Romilly indicated that seven enemy planes had been seen to crash, that eighteen broke up in mid-air, and that twenty-seven more went down in flames. Total claims originally registered included fifty-three destroyed, thirteen probably destroyed, and eight damaged.<sup>64</sup> These claims seemed to be excessive in view of the number of aircraft—estimated at not over 120—which could have intercepted. An Air Ministry analysis set probable figures for the Romilly action at a much lower level. Keeping in mind the heavy firepower of the U. S. force, the fact that this force had been under attack by fighters for nearly two hours, and that the visual evidence of planes



destroyed—even allowing for duplication in claims—pointed to heavy enemy losses, this report suggested thirty enemy fighters destroyed and fifteen to twenty damaged as a not unreasonable estimate.<sup>65</sup> Subsequently, VIII Bomber Command itself lowered even this figure; the revision of 5 January listed claims of 21/31/7.<sup>66</sup> German records suggest instead that the Americans shot down only two planes and damaged a third. Three other enemy fighters lost that day could be indirectly credited to the AAF mission, as also ten fighters listed as damaged for reasons not directly attributable to “enemy” action.\*

### *Logistical and Tactical Problems*

It was not enough to evaluate Eighth Air Force operations in terms simply of the results obtained. From the very beginning it had been apparent that its achievements would have to be interpreted in relation to the factors that limited both the scope of its operations and the degree to which those operations were effective. These limiting factors loom especially large during the early months dealt with in these chapters, for it was then that long-term plans were being laid for the air war against Germany—and, be it noted, always with an eye to what the Eighth Air Force was doing in these essentially experimental operations. The problems themselves fall into two large categories: (1) tactical problems and (2) those of supply, maintenance, and operations. Most of them had made their appearance and had received initial consideration in the weeks prior to November 1942. During the period covered by this chapter they developed rapidly and much thought and effort were expended in an attempt to solve them.

Basic, of course, among these factors was the size of the operating force itself, essentially a problem of logistics. The departure of the Twelfth Air Force in early November had left the parent organization with combat units amounting to seven heavy bombardment groups less one squadron† (two of which groups were scheduled for TORCH at some later date), one single-engine fighter group minus its ground echelon, and one observation group scheduled eventually for North Africa. Of the heavy bomber units, four (the 91st, 303d, 305th, and

\* This category, for example, might include planes suffering accident as a result of an exhausted fuel supply after combat. German records credit the mission with destruction on the ground by bombing of five GAF bombers and one fighter, and with four additional bombers damaged. (Information supplied through courtesy of British Air Ministry.)

† See above, p. 235.

44th) became operational only on 7 November; two (the 306th and 93d) had at that date been on an operational status for only one month. The 92d was used, from November 1942 until May 1943, for training purposes only. On 5 December the 93d Group was ordered to move its air echelon, minus one squadron, to North Africa for a temporary tour of duty which lasted until the end of February 1943. Meanwhile, one squadron of the 93d Group had been on antisubmarine duty with RAF Coastal Command from 25 October to 25 November, and another from the same outfit had been detailed as an experimental unit to work on the blind-bombing project. During November, December, and January, therefore, General Eaker could count on a combat force of at most six heavy bombardment groups.<sup>67</sup> The Twelfth Air Force had also left the Eighth so low in air force service elements that General Spaatz in November expressed doubts whether sustained operations could be maintained by the remaining combat units.<sup>68</sup>

Moreover, the prior demands of TORCH made it impossible to keep up to full strength those units that were regularly available. The problem of replacements received a great deal of attention during the fall and winter of 1942 both in Washington and in Headquarters, Eighth Air Force. Early in November, General Spaatz urged that the rate of replacement for units in the United Kingdom be stepped up to the level proposed by the War Department in July 1942. The plan then presented had provided for 20 per cent replacement in heavy bombers per month, additional aircraft for reserve and for the augmentation of units through December 1942 at the rate of two per month per group, and combat crews for 75 per cent of the aircraft thus provided.<sup>69</sup> On 2 December 1942 he cabled from Algiers urging that replacements for the African theater be expedited in order that no further drain would be necessary on the already strained units of the Eighth Air Force. Further withdrawals, he warned, would seriously affect operations from the United Kingdom which were of vital importance not only in themselves but because they prevented the enemy from diverting air strength to the Mediterranean.<sup>70</sup>

AAF Headquarters, while sympathizing fully with the plight of the Eighth, was apparently unwilling to jeopardize more critical projects in order to build up the force in the United Kingdom, especially in view of the fact that shipping space was no less at a premium than were men and materiel.<sup>71</sup> Moreover, the estimate of Eighth Air Force requirements in Washington seems not to have coincided exactly with

that made by Spaatz and Eaker, for records in AAF Headquarters did not indicate so serious a situation as that reported from the theater.<sup>72</sup> Be that as it may, by the end of January 1943 the Eighth Air Force was not receiving replacement planes and crews as fast as it was expending them.<sup>73</sup>

The result was that under existing operational conditions the force employed in the day bombing program was not large enough to accomplish any major item of the task it had undertaken, a fact which had become apparent during the campaign against the submarine bases. The size of the operating force also limited the choice of targets, for it was felt that only a force large enough to protect itself readily should be dispatched over the Reich. Yet, on the other hand, the necessity of restricting activity to a single, relatively narrow area in occupied France made it impossible to disperse the enemy fighter defenses and so tended to increase combat losses. In any event, it was obvious that a lower rate of loss might be expected when a force could be employed which was large enough to saturate any given system of defense.<sup>74</sup>

Regardless of the number of aircraft and crews on hand, the number that could be sent out on any particular mission depended on the ability of maintenance crews and depots to keep the aircraft in operational order, to repair battle damage, and to make such modifications as combat experience demonstrated to be necessary. That ability, in turn, depended on an adequate supply of parts and a force of trained personnel large enough and in a position to devote enough time to this work to keep up with the requirements of the operational units. In the fall and winter of 1942 neither of these conditions existed, and so it was not possible to realize fully the potential strength of the bomber force available. On the 15 missions studied in this chapter the VIII Bomber Command was able to dispatch an average force of 70 bombers with a maximum of 101, yet these figures represented a discouragingly low percentage of the total aircraft on hand in the theater. Through November, for example, only 51 per cent of this total was in combat condition.<sup>75</sup>

The Twelfth Air Force had left the Eighth depleted in service units, and those left in the United Kingdom were still required to give high priority to equipment destined for North Africa.<sup>76</sup> For similar reasons, the Eighth continued also to suffer from an insufficient flow of parts and tools.<sup>77</sup> And there appeared little likelihood that the situation would improve for some time to come, for, when shipping became available

to carry the required personnel and equipment, it would probably have to be used for transporting combat units. Although General Spaatz warned that "a marked reduction in the rate and efficiency of air operations must be expected until the required service elements have caught up with the combat elements," he advocated allocating available shipping to combat replacements as a matter of first priority, since the latter required more time to become acclimatized and might, if necessary, be supported on an emergency basis until normal service units arrived.<sup>78</sup>

At the same time, the Eighth Air Force was facing a rising rate of battle damage which placed an increasing load on the already inadequate repair facilities, with the inevitable result that a large proportion of heavy bomber strength remained inoperational. In September, 13.3 per cent of the attacking planes suffered reparable damage; in October 37.7 per cent. By December the percentage in this category had risen to 42.1, with January promising an even higher proportion of damaged planes.<sup>79</sup> Still further to complicate matters, it had been found necessary to modify the heavy bombers to meet unforeseen tactical and operational conditions and, moreover, to do the work to a large extent in the theater.\* Until a standard model could be turned out in the United States, fully equipped for combat in the European theater—and even then special projects would require special modifications—changes had to be made at almost all echelons by the cut-and-fit method, which again increased the load on available maintenance facilities.<sup>80</sup>

Maintenance difficulties were reflected in the relatively high rate of abortive sorties resulting from mechanical failure. Since October that rate had increased considerably, amounting in November to 23 per cent of all abortives. Crews were instructed to return without entering enemy territory if turrets became inoperative, if guns jammed, or any other important items of equipment failed.<sup>81</sup> It is possible, of course, that the anxiety of group commanders to get as many of their planes in the air as possible had the effect of starting some that, under less hectic operating conditions, might have been left on the ground for more thorough overhaul. In any case this was a serious matter, for the total abortive rate was itself high. Of the 1,053 bombers dispatched from 21 October 1942 to 13 January 1943, 421 had failed to attack.<sup>82</sup> In January, General Eaker admitted that, next to the large number of aircraft

\* See below, chap. 18.

out of commission, the large number of abortive sorties had been his chief worry during the preceding weeks.<sup>83</sup>

Even more important than mechanical failure as a cause of abortives was the weather. Too often the bombers had to take off in mud and water or fly in rain which caused their guns to freeze or their windows and sights to become blurred at high altitude. And there was always a very good chance that, regardless of expert predictions, the bombardiers would find their targets partially or totally obscured by clouds. As high as 50 per cent of the abortive sorties could be traced directly or indirectly to the weather. Things were improving slightly by January: crews were, for example, learning how, when runways were covered with water, to prevent icing of guns and turrets by the use of oil; and in some instances malfunction of bomb-bay doors owing to the same conditions was prevented by removing the doors completely.<sup>84</sup> But, in the final analysis, only fine weather could entirely eliminate these operational hazards.

Weather, indeed, continued to act as the greatest of all the factors limiting Eighth Air Force bombing. Only once during November and December was it reported that a mission had actually been canceled because of maintenance and repair difficulties, and then the trouble arose only after three successive days of operations. On the other hand, weather conditions held available aircraft on the ground on numerous occasions.<sup>85</sup>

High hopes continued to be placed on blind-bombing techniques, and much study was being devoted to the use made of special navigational devices by British Pathfinder units. It was hoped specifically that development in that direction, together with the improved weather which might be expected during the coming spring and summer months, would permit an average of six missions per month per operational bomber instead of the three missions averaged during the fall of 1942.<sup>86</sup> But the initial experiments in using single B-24's equipped with Gee for "moling"\* or "intruder" missions gave little ground for optimism. On 2 January 1943, four B-24's of the special experimental squadron made the first of these blind operations over manufacturing cities north of the Ruhr with the object of alerting air-raid crews and otherwise harassing the enemy. It had been specified that, in view of the

\* Missions flown by single radar-equipped bombers sent out in overcast weather for the purpose of alerting the enemy's antiaircraft defenses and generally contributing to a feeling of insecurity on his part.

valuable equipment carried and the small intrinsic value of any bombing done, the airplanes should return to base if cloud cover proved insufficient to give protection. Perversely, the weather cleared and all four returned without bombing. Twice more in January B-24's went out on expeditions of this sort, only to be foiled again by fine weather. Short of resorting to night bombing (the RAF had conducted eighteen missions during January) the Eighth Air Force had little choice but to wait for favorable weather and a wider selection of targets.<sup>87</sup>

The Eighth Air Force also faced certain major tactical problems. Success depended primarily on the ability of the day bombers to hit and destroy their objective and on their ability to defend themselves against flak and fighter attack. Questions on both these accounts had dogged Eighth Air Force operations from the beginning. During the fall and winter of 1942 they became rapidly more pressing. In order to hit such relatively small, isolated, and invulnerable targets as submarine base installations, better offensive tactics—particularly improved accuracy—would have to be developed. At the same time, the vigorous growth of German countermeasures called attention even more urgently to the problems of defense. Prior to 21 October neither flak nor fighters had seriously threatened the American bombers. Clearly, the Germans had been caught unprepared for a weapon such as the day bomber, which not only could do real damage from extreme altitudes but could also shoot it out with the best fighters in the Luftwaffe. However, as many observers, including General Spaatz, had foreseen, they lost no time in adjusting defensive tactics to cope with this unprecedented attack. If they adjusted neither so rapidly nor so radically as some had feared, they nevertheless gave the Eighth Air Force grounds for serious concern and taxed the ingenuity of its tactical experts.

Except for the few seconds of the bombing run, when the purpose of the heavy bomber is realized, all phases of a bombing mission are dominated by considerations of defense. But considerations of defense had to be carefully balanced against those of offense, for they were not always reconcilable; and they had also to be weighed in relation to each other, for what would offer protection against flak might increase vulnerability to fighters. For example, high-altitude bombing reduced risk from flak, but it also reduced bombing accuracy. Bombings by a single aircraft might, under ideal conditions, be best for both accuracy and protection from flak but would not provide sufficient defense against fighter attacks. Large bombing units flying in formation would



give adequate protection against fighter attacks but would increase flak hazards and at the same time reduce accuracy by enlarging the resulting bomb pattern. As experience was gained, constant adjustment was made in the multilateral compromise necessitated by this problem of integrating defensive and offensive tactics.<sup>88</sup> By early 1943 many of the basic lessons had been learned, much of the pioneer work having been done by the 1st Bombardment Wing under the successive command of Generals Longfellow, Kuter, and Hansell.<sup>89</sup>

German flak defenses at first had proved ineffective in opposition to aircraft flying at altitudes above 20,000 feet, and German fighter pilots had been unwilling to come very close, preferring to stand off just outside the range of the bombers' guns and wait for a favorable opportunity to duck quickly in and out of the formation. During October, enemy fighter tactics reflected a feverish determination to find a way to stop the day bombers. Though many types of attack were tried, tail attacks predominated. This had been the accepted angle of attack against bombers, however, and it was the type against which the USAAF had undertaken to protect its heavy bombers by the addition of especially heavy armament and armor plate.<sup>90</sup> The climax in this phase of the German attack came on 21 October when the FW-190's (bearing the yellow nose paint characteristic of Goering's elite fighter wing) made a series of desperate attacks from the rear in an apparent effort to find a blind spot safe from both dorsal and ball turrets. They came in, sometimes in formations of three, at flight level, opening fire at 800 yards. Three bombers were lost as a result of this action, and six others damaged.<sup>91</sup>

Beginning with the St. Nazaire mission of 23 November, the Germans changed their tactics abruptly. Oberleutnant Egon Mayer, who commanded the attacking fighters that day, is credited with developing the head-on attack. Having studied the largely unsuccessful efforts made so far to stop the heavy bombers, he ordered a frontal attack, leading one element personally. The tactic worked well, for it caught the American bombers in their most vulnerable spot.<sup>92</sup> At that time some B-17's had one .30-cal. hand-held gun, firing through one of four eyelets just off center, and some mounted two .50-cal. side nose guns. In either case, a blind spot was left in front which neither the upper turret nor the ball turret could reach. The B-24's were equipped with .50-cal. side nose guns, and a single .50-cal. center nose gun mounted to fire below horizontal only. This armament also left a blind spot which the

upper turret could not cover.<sup>93</sup> The only disadvantage to the head-on attack from the enemy point of view was that it made necessary a high degree of skill and training on the part of the fighter pilots in order to make effective use of the short time allowed by the very rapid rate of closure, even when the approach was executed at low speed; and it was for that reason that it was not universally adopted and, indeed, was officially frowned upon in August 1943 when the number of inexperienced pilots had increased so rapidly that such attacks could only prove disastrous. They continued to be made, however, throughout the air war in Europe.<sup>94</sup>

Through January 1943 nose attacks continued to predominate and accounted for most of the losses suffered by the VIII Bomber Command as a result of encounters with enemy fighters.<sup>95</sup> Losses from enemy fighter fire, in turn, constituted by far the larger proportion of total losses, which had risen from an average of 3.7 per cent of the attacking force in November to 8.8 and 8.7 per cent in December and January respectively.<sup>96</sup> Bomber crews had to face the enemy's frontal attacks very frequently just over the target, when the confusion inevitably resulting would be most likely to spoil the bombardier's aim. In fact, it was believed that to break up the bombing run had now become a primary objective of the German fighters.<sup>97</sup> The frontal attacks, therefore, came during these months to be the chief defensive problem of the Eighth Air Force.

It was immediately clear that the only effective countermeasures would be the addition of increased forward firepower in the bombers and an improved defensive formation which would give all planes the benefit of mutual protection. Of these remedies, the addition of nose guns was the more critical item, because it would involve a great deal of time-consuming modification both in the United Kingdom and in the United States. Meanwhile makeshift tactics were devised. One method of countering the front-quarter, level attack—the method reported in December as the one officially approved—consisted of a diving turn into the attack, which uncovered the top turret and, incidentally, tended to spoil the enemy pilot's aim. It was hoped that in this way any such attack would encounter not only the front, side-firing guns but the top turrets of at least some bombers in the formation.<sup>98</sup>

Modification for nose guns began promptly. Pending the installation of a standard power-driven turret in the B-17, flexible, hand-held .50-cal. nose guns were provided in most of the Fortresses destined for

the European theater; and the standard B-24 center nose gun was modified in such a way that it could fire above the horizontal.<sup>99</sup> In the theater, similar modifications were undertaken on as many aircraft as could be accommodated in the depots. The need for such modifications was so great that improvised field installations were authorized as long as they conformed to basic requirements. By mid-January, most heavy bombers in the United Kingdom were equipped with effective forward fire, if only from single, improvised, .30-cal and .50-cal. hand-held guns.<sup>100</sup> Complete satisfaction could only result from the installation of a turret in the nose, but it was not until August and September of 1943 that the improved B-17's and B-24's arrived in the theater complete with this power-driven equipment.<sup>101</sup>

Although it was a standard defense against all fighter attack, the large formation of bombers so stacked as to provide mutual fire support proved especially helpful in countering the frontal attacks. Indeed, it was during the fall and winter of 1942, and primarily in answer to this particular problem, that the 1st Bombardment Wing evolved a system of formations which became the prototype for operations in the theater. When General Kuter took over the wing on 6 December 1942, he found the four groups each operating according to its own tactical doctrine. No wing organization existed for tactical purposes, and consequently the groups collaborated only in the sense that they all attacked the same target roughly at the same time. No effort was made to secure additional fire support by coordinating group tactics. Squadrons and groups had developed into cohesive teams, but the wing as a whole had not become a combat unit. Acting on the assumption that the larger the formation, consistent with requirements of maneuverability, accuracy, and control at high altitudes, the more mutual fire support would be obtained, General Kuter set about to weld the squadrons and groups into the largest practicable combat units.<sup>102</sup>

At first the groups had bombed in elements of three aircraft, but fighter attacks demonstrated that bombing by elements, however satisfactory from the point of view of accuracy, did not provide sufficient defensive power. Bombing by squadrons composed of two elements of three aircraft each was then tried. The intensity of enemy attacks soon made it necessary to resort to bombing by groups of three squadrons. Thus a formation composed of eighteen to twenty-one bombers, known as a combat box, became the standard minimum combat unit, and it was stacked in such a way as to uncover as many of the top and

bottom turrets as possible in order to bring the maximum fire to bear on the critical forward hemisphere. It was considered the smallest unit feasible for defensive purposes and the largest that could be handled readily on the bombing run.<sup>103</sup>

But it appeared, especially on the trip toward the target and again on withdrawal, that mutual fire support could be greatly increased by combining two or more combat boxes into a single defensive formation. It was not, however, considered practicable to fly the entire bombardment wing in one formation. Anything larger than a formation of two or three combat boxes would have required deployment in such depth that the differences in wind velocity and aircraft performance at different altitudes would have aggravated the tendency of any formation to telescope and lose effective position. Moreover, two groups were about all that could be readily briefed and controlled by a single combat commander. Accordingly, the 1st Bombardment Wing formed two combat wings of two groups each. In each of these combat wings the senior group commander assumed command and was given full authority in planning and executing the mission. This organization existed for tactical purposes only and in no way affected the administrative organization of the bombardment wing.<sup>104</sup>

The combat wing, consisting of two or three combat boxes, thus became the maximum defensive formation. It was generally deployed in echelon up, in a vertical wedge similar in principle to that of the combat box, although in the period under review many variations occurred. In early 1943 it was apparently also planned to use the combat wing as a unit in formation bombing whenever the fighter opposition seemed likely to be strong enough immediately over the target to warrant its use; this, despite the fact that it would be a clumsy formation to maneuver around the initial point onto the bombing run and that the resulting bomb pattern would tend to be too large for the desired accuracy.<sup>105</sup>

Fighter cover, and lots of it, had originally been held a prerequisite to day bombing, and the early missions had been flown under a huge umbrella of friendly fighters. But after October most priority targets lay beyond the range of the Spitfires, which for the time being were the only fighters available for such operations. They usually accompanied the bombers part way in toward the target area and provided withdrawal support on the way out. During the missions, moreover, large fighter forces, still for the most part RAF, conducted diversionary sweeps to confuse the enemy RDF; but the bombers were generally

left to the as yet uncertain protection of their own gunners during the critical time over the objective.<sup>106</sup>

As losses mounted during these partially or entirely unescorted missions, and especially as the time drew near when operations would have to be conducted over the Reich itself with its presumably denser fighter defenses, it began to look as if the long-range fighter would after all be a necessary part of a successful day bombing offensive. By 15 January the 78th Fighter Group was due to have its quota of P-38's, and General Eaker hoped that with these he could reduce bomber losses over the submarine bases by one-half. Unfortunately this group soon followed its predecessors to Africa, and the need for long-range fighters remained.<sup>107</sup>

As an alternative to the long-range fighter, the escort-bomber, known provisionally as the XB-40 or YB-40, was in the process of being developed. A B-17 especially equipped to combat enemy fighters, it carried extra armament, armor, and ammunition in place of the usual bomb load. Conceived as a possibility for the European theater in 1941 and actually planned in the summer of 1942, it was scheduled to appear in the European theater by March 1943.\* Although contemplated without enthusiasm by General Eaker, it was favored by many commanders who hoped that, by mixing it with the bombers in ratio of 1 YB-40 to 2 or 3 bombers, they might free the latter from the limitations of fighter range and send them over Germany as far as their fuel would take them.<sup>108</sup>

The Eighth Air Force had less reason to fear antiaircraft fire than fighter attacks during the period under review. Barely one-fourth of the bombers lost in action could be credited to flak alone, and only a few more bombers suffered flak damage than were hit by enemy aircraft. But, whereas the percentage of damaged aircraft that were hit by fighter action showed little tendency to increase, the percentage of damaged bombers that had been hit by flak appeared definitely to be rising. And on two occasions, at St. Nazaire on 9 November and on 3 January, substantial losses had been sustained as a result of antiaircraft fire.<sup>109</sup>

The increase in flak damage reflected a marked improvement in German antiaircraft technique. Flak batteries were now concentrated in such a way as to fit the pattern of USAAF targets, with special atten-

\* See Vol. I, 604.

tion given to the submarine bases on the Bay of Biscay. Originally the only type of fire encountered was that termed a "continuous following," which required the gunners to make a continuous prediction of the position of the target aircraft. Often this type of fire was thrown up behind the formation and gradually worked forward. It was essentially a trial-and-error method in which altitude could be estimated more easily than deflection, since the gunner had to predict some twenty seconds in advance the point at which the target aircraft would be and since his 88-mm. shells had a lethal radius of only thirty feet. Although the gunners seem to have improved the accuracy of their fire, this method proved relatively ineffective at high altitudes, provided that positive—though naturally not regular—evasive action were taken by the bombers.<sup>110</sup>

A much more effective technique, if the target could be determined in advance, was that called a "predicted barrage," in which flak was thrown up throughout a limited area through which it had been calculated the attacking aircraft would have to fly. It was a method uniquely adapted for use over the submarine bases, which were well-known objectives not easily confused with neighboring targets. In fact, it was at St. Nazaire, on 3 January 1943, that a predicted barrage was first encountered—with serious results to the attacking bombers. The technique was not, however, one likely to succeed in such areas as the Ruhr, where targets of high priority abounded.<sup>111</sup>

The tactics best suited for penetrating heavy flak defenses were simple enough, but they almost all necessitated some degree of compromise with the requirements for accuracy or for defense against enemy fighters. Positive evasive action might be taken for as long as possible, the length of the level bombing run being reduced to the shortest commensurate with careful aiming. The bombers might converge on the target nearly simultaneously on at least two axes; they might maintain a substantial differential in altitude between units; and they might take maximum evasive action immediately after release of the bombs. But care had to be taken not to disperse them to such an extent that elements would fall prey to fighter attack. Finally, to escape flak most effectively, the bombers had to fly at the highest altitude compatible with accurate bombing.<sup>112</sup> Here, in a sense, was the most difficult compromise to make. It might fairly be said that, in these early months at any rate, flak handicapped effective bombing operations less by destroying or damaging bombers than by forcing the attacking planes to bomb



at altitudes too high for their more or less inexperienced crews to achieve consistent accuracy.

The question of bombing accuracy overshadowed all others pertaining to the offensive aspect of bombardment. Unfortunately it is not possible to say anything very precise about the degree of accuracy achieved in those days, for the information available is too incomplete, too inconsistently reported, and filled with too many variables to permit any worth-while conclusions. Despite the fact that AAF Headquarters exhibited an anxious interest in the subject, it was only on data accumulated after 1 January 1943 that any systematic analysis became feasible.<sup>113</sup> This much, however, is incontestable: results in the fall and winter of 1942, though initially encouraging, especially for inexperienced crews, were disappointing to all those who, trained in the "pickle-barrel" school of bombing, knew how accurate the American bombers could be.<sup>114</sup> An average of only about 50 per cent of the bombs dropped could be identified by photographic reconnaissance. Although many "duds" were reported by ground sources, it may be assumed that a large proportion of the unidentified bomb falls represented "gross" errors.<sup>115</sup>

It was this prevalence of so-called gross errors that concerned bombing analysts most acutely. Under practice conditions, accuracy might conceivably be improved indefinitely by training the bombardiers to set their sights more precisely and the pilots to hold a steadier course during the run on the target. There were thus in practice exercises few gross errors to contend with and few errors stemming from intrinsic faults in the equipment. Most errors were errors of adjustment alone. Things were very different in combat, where the confusion and excitement increased the incidence of gross errors to the point where they became the dominant factor governing bomb dispersion. Clearly, then, if the cause of these sizable errors was not discovered and removed, the Norden bombsight with its delicate adjustment would be valueless. It was, in fact, considered possible that in such an event an inferior sight requiring less careful adjustment might have to be adopted, a step which would seriously have compromised the ideal of precision which underlay the American bombardment theory.<sup>116</sup>

Undoubtedly many gross errors resulted from mechanical failure, the bombs either hanging up or salvoing prematurely. At high altitude the extreme cold, in addition to the strain on the airplane caused by the bomb load, sometimes impaired the functioning of the release mecha-

nism. Much more important was the frequent failure of pilots, bombardiers, and navigators to identify the target. Although an extreme case, it is instructive to notice that on the operation of 18 November 1942 one formation was able to bomb St. Nazaire under the impression that it was bombing La Pallice, 100 miles away. A more typical case occurred in the Lille raid of 8 November when some twenty to twenty-five bombs struck near a factory three miles short of the intended target, which was also a factory but situated in quite different surroundings.<sup>117</sup> The development of perspective maps, then well under way, helped reduce the likelihood of mistakes of this sort by providing the bombardier with a picture of the target as he was likely to see it rather than as it appeared on the older type of vertically projected target map.<sup>118</sup> Then, too, it was often difficult to follow a set course in the face of unexpectedly strong cross winds. And many errors arose from failure to set instruments properly, either because of combat excitement or because the severe cold and the encumbrances of oxygen apparatus, heavy clothing, and parachutes prevented dexterous manipulation.<sup>119</sup>

Most unsettling of all factors making for inaccuracy was the necessity of conducting a steady bombing run in the face of enemy antiaircraft or fighter action. To one observer, bombing accuracy appeared to be inversely proportional to the resistance encountered at the target. In order to guard against flak, evasive action was normally taken for as long as possible on the approach to the target, leaving a maximum of fifty seconds for the level bombing run. During that time delicate adjustments had to be made with extreme dexterity and speed, and often under enemy attack.<sup>120</sup> An additional difficulty arose from the fact that, in order to maintain an effective defense against fighters, the formation was likely to be too large to produce a satisfactory bombing pattern.<sup>121</sup>

Various solutions to these bombing problems were suggested. One obvious way to increase accuracy, though not of course to reduce the number of gross errors, was to bomb at lower altitudes. But the experiment of 9 November at St. Nazaire discouraged further planning in that direction, and a lower probability of error was exchanged for lower vulnerability to antiaircraft. Much naturally depended on a constantly improved state of training and experience, which alone would remove many of the causes of error.<sup>122</sup> To insure a steady bomb run and so give the bombardier time to set his sights, pilots and bombardiers were urged to use their automatic flight-control equipment

(AFCE) which, when it functioned properly as at that time it did not always do, gave more precise results than manual flying.<sup>123</sup>

Some commanders believed that one way to get accurate aiming in formation bombing would be to have the leader in the formation set his sights accurately for deflection, even at the expense of accuracy in range, and leave the remaining crews to set theirs for range only, taking their direction simply by holding their place in the formation.<sup>124</sup> In this way group bombing could be accomplished without the risks and confusion likely to ensue should each plane in the formation attempt to make its own adjustment for deflection. In a further effort to exploit the possibilities of group bombing, and incidentally to escape from the irregularities that seemed always to crop up when bombardiers of uneven ability bombed individually, some groups resorted in January 1943 to bombing entirely "on the leader," each bombardier taking his signal from the lead plane. Initial results of this method, though not at that time conclusive, proved very encouraging.<sup>125</sup> Finally, one of the most urgent requirements for improved accuracy was some sort of improved firepower by means of which the frontal attacks, made so consistently by the German fighters in December and January, could be effectively countered and the morale of the bomber crews be correspondingly raised.<sup>126</sup>

The problem of accuracy, and indeed that of bombing in general, thus became inextricably entangled with that of defense. The method of bombing as worked out by the 1st Bombardment Wing during late 1942 tended to be dictated more by the nature of the opposition met than by the theoretical requirements of precision bombardment. The enemy practice of attacking during the bombing run, even in the presence of anti-aircraft fire, made it advisable to preserve as large a formation as possible and one so arranged as to give all elements the maximum of mutual protection. A large formation (and it was tentatively suggested that bombing might be done in combat wing formation) increased vulnerability to flak and, if the bombing were done on the leader, it was likely to produce a larger bomb pattern than when the work was accomplished by smaller formations. If, on the other hand, flak defenses were known to be concentrated, it was necessary to accept higher vulnerability to fighters by splitting the formation so as to reduce risk from flak.<sup>127</sup>

In this chapter and the one immediately preceding it, a story has been told of things accomplished and problems encountered by the Eighth

Air Force prior to mid-January 1943. It was on the basis of these achievements and in the face of these half-solved problems that General Arnold took his stand on behalf of the daylight precision bombing of Germany at the Casablanca conference in January. The record was incomplete and the conclusions it warranted were necessarily tentative; but it enabled him to state the case for the daylight bombardment campaign strongly enough to insure for it a place, and an important one, in the plans forged at that time for the defeat of the European Axis.

## CHAPTER 9

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### *THE CASABLANCA DIRECTIVE*

THE decision to abandon an early invasion of Europe in favor of TORCH left Allied strategy in what may now seem a state of surprisingly unstable equilibrium. By some, particularly by the U.S. Navy, it was apparently taken as a signal for a radical reorientation of policy, amounting even to a shift from the strategic offensive against Germany to the strategic offensive against Japan. At best the balance between these two concepts, as early agreed upon, had been a delicate one. In the spring of 1942 the President had found it necessary to intervene in order to prevent BOLERO from being slowed down.<sup>1</sup> And although it was the intention of those who advocated the North African campaign to do no more than postpone BOLERO and ROUNDUP (if, indeed, they admitted the necessity of any delay at all), the fact remained that, in shifting to TORCH, they had altered the basis for planning, as far as the immediate future was concerned. At the very least, they had opened the subject of basic strategy to a searching review.

Discussion began promptly after the tentative adoption of the TORCH plan on 24 July 1942. Representatives of the Navy made it clear that in their estimation Allied strategy was in the process of reorientation, not only in the direction of the Mediterranean but also toward the Pacific.<sup>2</sup> Regarding the deployment of air forces in particular, the Navy representatives argued, in effect, that the build-up of air strength in the United Kingdom had been an integral part of the BOLERO-ROUNDUP plan, that its purpose was to support the invasion of Europe, and that, since ROUNDUP no longer constituted the primary project, aircraft could now be considered as a separate feature, committed to the war against Germany only insofar as they were re-

quired by TORCH and operations in the Middle East. Admiral Leahy pointed out that, whatever commitments were contemplated, it would have to be understood that U.S. forces then operating in the Southwest Pacific "must and will be maintained." Admiral Cooke referred significantly to the equipping of a large number of island air bases.<sup>3</sup>

There had even been some talk, while conversations were still being held regarding TORCH, of shifting to the offensive in the Pacific. The critical question at that point was whether the U.S.S.R. would continue to be an effective ally. Should she succeed in her battle to hold off the German army, there would be no doubt about the need for maintaining the maximum pressure on Germany. If, however, Soviet resistance were to collapse, Navy spokesmen urged that the maximum Allied effort, or that of the United States at any rate, should be shifted to the war against Japan. In any case, they insisted that Allied strategy had become too specialized and that production of weapons should be so balanced as to meet more than one eventuality.<sup>4</sup>

As far as the air war was concerned, the entire case presented by the proponents of the Pacific strategy appeared to AAF observers to rest on two fundamental misconceptions regarding current plans—in addition of course to the Navy's highly developed sense of responsibility for a theater of operations peculiarly its own. In the first place, the Navy had erred in considering the projected bomber offensive from the United Kingdom by USAAF planes to be inseparable from the notion of air support for a European invasion. If support of ground and sea operations had been the principal mission of the heavy bombers, then it would have been perfectly logical to argue that once those operations had been indefinitely postponed so likewise had the need for the heavy bomber activity which was to support them. But to do so was obviously to misinterpret the nature of the strategic bombardment program. Both the English and American air representatives among the Combined Planners stoutly maintained that long-range attacks on German industry and communications had been and must continue to be considered as a project preliminary to but otherwise quite independent of any European invasion—a separate offensive operation in a theater which the postponement of invasion had made for the immediately foreseeable future entirely an air theater. To all of these arguments the Navy spokesmen replied that the maximum pressure of air bombardment could only be maintained when coordinated with ground and sea operations.<sup>5</sup>



According to the AAF way of thinking, there was also a tendency among both naval and ground men to misinterpret the role of air power in the TORCH strategy itself. General Arnold and the AAF planners had not found it easy to reconcile TORCH with their original conception of a combined bomber offensive from the United Kingdom. They had accepted the plan only after strenuous debate, and during the remainder of 1942 they continued to consider it a diversion from the main business of bombing the sources of German war power.<sup>6</sup> Having accepted it, however, they were concerned to implement it as decisively as possible, and as the plan unfolded they were ready enough to see certain putative advantages accruing to the air arm in the way of alternate bases of operations and a resulting flexibility of planning.<sup>7</sup> TORCH was, they believed, an extremely dangerous mission which would require the use of all air forces not engaged in essential operations elsewhere. At the same time, they considered bombing operations from the United Kingdom, at the expense of which any diversions to Africa must obviously be made, to be not only of primary importance in the longer perspective but an immediately essential part of the TORCH plan. In addition to providing air forces in support of African land operations, it would be necessary to leave a striking force in the United Kingdom to contain a substantial portion of the Luftwaffe in northwestern Europe, and so to prevent it from concentrating dangerously against the Allied forces in the Mediterranean and Africa. Air forces in the Middle East would also contribute toward this objective of dispersing the enemy air power. Conversely, air operations in Africa and the Middle East would contribute to the success of the bomber offensive from the United Kingdom, even though the latter had been somewhat depleted in order to make such air activity possible in the south. Although definitely a diversion, the African project would tend to disperse German air strength and thus make the bombing of Germany an easier matter.<sup>8</sup>

From this point of view, the European and North African and Middle Eastern areas of conflict became one theater as far as air operations were concerned. The AAF even hoped to exploit the mutually complementary nature of those operations to the fullest extent possible by uniting them under one air commander—who, incidentally, could see to it that combat units diverted to Africa would be returned, upon completion of their mission or during periods of minimum activity, for

the major bombardment campaign from the United Kingdom.\* Meanwhile, the AAF was content to strike at Germany from any available bases and recognized the supposed advantages to be obtained in the Mediterranean areas in the way of fine bombing weather and the eventual accessibility of Italian industrial objectives.<sup>9</sup>

In this way it was possible for AAF planners (with substantial backing from General Marshall and OPD) to rationalize TORCH without too seriously compromising their original idea of a combined bomber offensive against Germany. But it was a rationale in which the air requirements of the United Kingdom enjoyed a much stronger position than they did in Navy thinking. As a matter of fact, the AAF interpretation of the TORCH strategy, arising as it did out of strictly air considerations, was not at first shared by all Army authorities. Certainly General Eisenhower was prepared in September 1942 to bring bombing operations from the United Kingdom to a complete halt if necessary in order that Eighth Air Force resources might be devoted entirely to preparing for TORCH.<sup>10</sup>

### *Problems of Strategy and Control*

The official AAF position, originally outlined in AWPDP-1 in September 1941,<sup>†</sup> was reaffirmed with little essential change in September 1942. In answer to a request from the President for a statement of the requirements of the Army and Navy and of U.S. production for the Allies "in order to have complete air ascendancy over the enemy,"<sup>11</sup> AAF planners issued on 9 September a document known as AWPDP-42, which served as the basis for all AAF strategic planning prior to the Casablanca conference of January 1943.

The authors of AWPDP-42 held that it would not be possible to mount an effective air offensive simultaneously against both Germany and Japan with the resources available, especially in view of the fact that U.S. air forces would have to be employed also in support of land operations in North Africa, the Middle East, and Burma, in support of amphibious operations in the South and Southwest Pacific, and in connection with antisubmarine patrol and hemisphere defense. In a choice between Germany and Japan, all considerations still favored Germany as the objective of first priority. Allied armed forces were not within striking distance of Japanese military strength at its vital sources. A sus-

\* See above, pp. 61-66.

† See Vol. I, 145-50.

tained air offensive could not therefore be waged against Japan unless use of the Soviet maritime provinces was secured, a doubtful contingency. The European situation, on the other hand, presented excellent opportunities for effective use of the air weapon. Indeed, in the initial stages of a war against the European Axis, air power alone could be brought directly to bear against Hitler's stronghold.

As the AAF planners saw it, the strategic outlook in Europe was as follows. By the time the air strength contemplated in AWPD-42 could be made ready for employment, large Axis ground forces might well be released from the Russian front for action elsewhere. Thus, with ground forces of the Allied nations numerically inferior to those available for deployment by the Axis on the western front, it would be necessary to depend heavily upon numerically superior Allied air forces, which should be used to deplete the air power of the enemy and to undermine the economic structure which supported his land forces. For 1943 and the early part of 1944, priority should accordingly be given to an air offensive against Germany. When that operation was successfully accomplished, as it could be by mid-1944 if the over-all requirements of 63,068 combat aircraft for 1943 were met, it would then be feasible to mount a combined land offensive against Germany and an air offensive against Japan, either successively or simultaneously, in the latter part of 1944.

The projected air offensive against Germany would take the form of a combined strategic bombardment offensive such as both U.S. and British airmen had contemplated since the entry of the United States into the war. The USAAF, with an operational bomber force of 2,225 planes deployed in the European theater by January 1944, would concentrate on the "systematic destruction of selected vital elements of the German military and industrial machine through precision bombing in daylight." The RAF would concentrate upon "mass air attacks of industrial areas at night, to break down morale," an effort expected, in view of an assumed shortage of skilled labor in Germany, to have a "pronounced effect upon production."<sup>12</sup>

The policy thus enunciated was one to which General Arnold was personally devoted and in which he was enthusiastically supported by Generals Spaatz and Eaker.<sup>13</sup> Some doubts arose during the fall of 1942 as to the suitability of the United Kingdom as a base for a day bomber offensive because of the dismal data compiled regarding weather conditions in northwestern Europe. But these doubts, insofar as they

affected basic strategic planning, were of minor importance. At most it was seriously debated whether the heavy bomber force should, in event of a successful invasion of North Africa, be moved to bases on the Mediterranean during the winter months where weather conditions at that season presumably would be much more favorable to precision bombing than in the United Kingdom.<sup>14</sup> Moreover, it was confidently expected that improvement in blind-bombing techniques would successfully circumvent conditions of poor visibility.

Throughout AAF thinking there may be detected the well-founded fear that U.S. air forces would be dispersed to all parts of the globe in answer to particular local needs but without reference to any one strategic plan by which the strength of the AAF could be concentrated with decisive effect. Remarking to his staff in August 1942 that a war could not be won with forces scattered all over the world, Arnold insisted that theater commanders in minor theaters be instructed to get along with a minimum air force so that "an overwhelming number" of planes would be available in major theaters. "We have," Arnold told his staff, "an education job as well as an allocation job." In another connection he asserted that successful air operations depended on "the continuous application of massed air power against critical objectives."<sup>15</sup> This doctrine of the concentration of force was fundamental to all AAF strategic planning and was, of course, especially applicable to the proposed bomber offensive from the United Kingdom.<sup>16</sup>

Appreciating the fact that all Allied commanders did not fully share this point of view and anticipating a battle over the entire problem of diversions from the United Kingdom, AAF Headquarters took steps to convert the doubtful and to assemble an impressive array of opinion in support of its strategic policy. In late August, General Spaatz was requested to enlist the aid of key commanders in the theater, for it was feared that unless such support could be obtained "we stand a chance of having our air strength there so dissipated by diversions elsewhere as to be only a token effort."<sup>17</sup> Another and similar request was made on the completion of AWPD-42 in September.<sup>18</sup>

Partly, no doubt, as a result of General Spaatz' influence, Eisenhower indorsed the idea of the interdependence of air operations in all African and European areas. On 5 September he sent a message to General Marshall in which he made the point that the United Kingdom was one of the few places in the world at that time in a position both to support operations of the TORCH forces and to strike at the heart of the prin-

cial enemy. Moreover, it was a place where continuity of action could be counted on through the air operations of the British. It would therefore be necessary, he stated, to capitalize on these advantages. He planned if necessary to use the entire U.S. air force that was in the United Kingdom in support of TORCH. Operating over western Europe, the air force could contain a large part of the Luftwaffe in the north and, when necessary, could be shifted temporarily to African bases. Accordingly he requested that a strong force, especially of heavy bombers, be maintained in the United Kingdom, amounting by 15 October 1942 to ten heavy bomber groups and five fighter groups. He urged the deployment in the United Kingdom of twenty heavy bomber, ten medium bomber, and ten fighter groups by 1 January or sooner if possible.<sup>19</sup> In view of the service being performed by Eighth Air Force bombers in the United Kingdom, General Eisenhower also was prevailed upon to rescind on 12 September his earlier order terminating bombing operations there in favor of TORCH. Other messages, including opinions from Generals Patton, Clark, and Spaatz, supported his estimate of air requirements and gave substance to the idea that air forces deployed in Europe and Africa should be considered as mutually complementary.<sup>20</sup>

These communications arrived in Washington, as AAF Headquarters had hoped, just in time for a critical debate in the JCS over fifteen groups reallocated in July from BOLERO to the Pacific. On 28 August the Joint U.S. Strategic Committee had submitted a report to the Joint Staff Planners on the detailed deployment of these units. It was assumed that the provisions of CCS 94, which had authorized the diversion, were binding and, with critical operations well under way on Guadalcanal, there was no discussion regarding where the diverted air units should be deployed when ready, but Army and Navy members disagreed radically as to when they were to be made available. The Army representatives maintained that no withdrawal should be made from BOLERO, except for one heavy bombardment group already ordered to the Pacific, until TORCH, the Middle East, and the United Kingdom, in that order, had been brought up to strength in air units as indicated in CCS 91, dated 7 July 1942. The Navy proved willing to admit the importance of TORCH and of commitments to the Middle East but insisted that the South and Southwest Pacific be given precedence over the United Kingdom, which thus would fall into the position of fifth and lowest priority.<sup>21</sup> Support for the Navy's position came in a

flood of requests from the Pacific during August and September for additional aircraft. Nor did these requests necessarily embody only the naval point of view. Maj. Gen. Millard F. Harmon, commanding general of U.S. Army Forces in the South Pacific, like all commanders in active theaters, strove vigorously to secure reinforcement for his command; and in view of the brisk fighting then taking place in those parts, he had a better talking point than most.<sup>22</sup>

To accept the lowest priority for BOLERO, it was estimated, would be to prevent any significant increase in the force of U.S. bombers in the United Kingdom for the rest of the year.<sup>23</sup> But it appears that General Arnold's opposition was based on considerations larger than the immediate effect upon the bombardment campaign in Europe. Only two of the fifteen groups in question belonged to the critical category of heavy bombers, and one of these had apparently already been irretrievably lost to the Pacific.\* Arnold was chiefly concerned to preserve against unnecessary diversion the projected strategic bombardment program and to protect a necessary priority for the war against Germany. It is not surprising, therefore, that he fought the threat of further diversion of AAF units to the Pacific with every possible argument and with the weightiest military opinion available.

On the one hand, he reiterated the standard AAF strategic doctrine: that Germany was the chief enemy, that for many months to come the only way of striking offensively and decisively at Germany's vitals was by aerial bombardment, and that, in view of the need for coordinated air effort in both Europe and Africa during the forthcoming TORCH campaign, those theaters must be considered mutually complementary. In addition, he pointed out that diversions to the Middle East, to TORCH, and now to the Pacific left only twenty-five of the fifty-four groups contemplated in the BOLERO-ROUNDUP plan—even on paper. On the other hand, he argued not only that the Pacific areas had on hand enough aircraft to keep the Japanese at bay but that they lacked adequate base facilities for any substantial increase in air strength.<sup>24</sup> Army intelligence estimated that American air forces in the Pacific, amounting to a total of some 5,000 planes (including those carrierborne), already outnumbered the Japanese air force, which would not likely reach 4,000 before the spring of 1943.<sup>25</sup> As for the capacity of Pacific bases, Arnold decided to inspect them personally to determine at first hand what facilities were available. JCS discussions

\* See again, pp. 61-62.



accordingly were recessed on 15 September pending his return from the inspection.<sup>26</sup> The result of his personal investigation was registered on 6 October in a stated belief that there were in the general area the maximum number of aircraft which base facilities could handle.<sup>27</sup>

Within a week, it was clear that JCS discussions had reached a virtual deadlock. Admiral King was willing to concede priority to North Africa and the Middle East, although he felt that neither exceeded in immediacy the needs of the critical campaign in the South Pacific. But both he and Admiral Leahy were unalterably opposed to giving the bomber offensive from the United Kingdom precedence over any operations in the Pacific.<sup>28</sup>

Meanwhile, the military situation in the South Pacific had become so critical that, on 24 October, President Roosevelt intervened. In an urgent memo to the Joint Chiefs of Staff, he declared it to be necessary at all costs to hold Guadalcanal<sup>29</sup> and added: "We will soon find ourselves engaged on two active fronts and we must have adequate air support in both places even though it means delay in our other commitments, particularly to England. Our long range plans could be set back for months if we fail to throw our full strength in our immediate and impending conflicts." The President's action had the effect of settling the problem of diversion\* for the time being on the ground of unavoidable military necessity without seriously prejudicing either the case for the war against Germany or that for the strategic bomber offensive from the United Kingdom. His memo gave temporary priority to the urgent demands of the Pacific but, by its silence on the subject of basic strategy, it implied a strict adherence to the *status quo*. And so ended the first and in a sense the decisive phase of the controversy. Never again were the claims of the Pacific presented with so great determination, and when the problem of diversion again arose, it concerned the Mediterranean rather than the Pacific.

American air commanders had become reconciled to the prospect of a minimum bombing effort from the United Kingdom for the rest of 1942 and had even been able to see in a rapid and decisive North African campaign the promise of ultimate assistance to the strategic bombing effort. As early as 17 September, AAF Headquarters had proposed the creation of a single air theater embracing all operations against the European Axis.<sup>30</sup> Such an over-all command would make it possible to capitalize on the flexibility and mobility inherent in air

\* See Vol. IV for air deployment in SOPAC.

power; planes not only could be moved when necessary from the United Kingdom to Africa with a minimum of confusion but they could be brought back to the United Kingdom as the occasion dictated with equally little administrative difficulty. The proposed "theater air force" had still another virtue. As General Spaatz put it late in October: "One of the principal advantages to establishing a single European Air Theatre is that it will have greater influence in attracting forces to this side of the world rather than to the Pacific."<sup>31</sup> The English weather in October, moreover, made the possibility of operating a bomber force from Mediterranean bases a reasonably attractive prospect.

Late in that month, conversations between Spaatz and Eisenhower resulted in the first formal step toward establishing the proposed theater air force. A plan of 19 November, involving the Eighth and Twelfth Air Forces only, charged the commanding general of the USAAF in the European theater with the duty of advising the theater commander on all matters in which USAAF units in ETOUSA were concerned, of commanding all AAF units in the theater, of preparing plans for their operations, and of coordinating strategic plans and operations with the RAF.<sup>32</sup> General Eisenhower was inclined to postpone action on this plan until the capture of Tunisia, by providing the desired air bases, had removed the problem from the sphere of academic discussion.\* But on 15 November, Arnold wrote to both Spaatz and Eisenhower expressing again his concern that "unless we are careful, we will find our air effort in Europe dispersed the same way we are now dispersed all around the world." Air operations in Europe, he declared, must be planned and controlled by one man; and as the man for the job, he suggested General Spaatz.<sup>33</sup> Consequently, Eisenhower decided to act at once, to the extent at least of giving the plan informal effect.<sup>34</sup> On 1 December, Spaatz was transferred to Africa as Eisenhower's air adviser, leaving Eaker in command of the Eighth.<sup>35</sup>

To give this informal air organization official status would require time. Any final reorganization, moreover, would have to take into consideration a proposal made by the British chiefs of staff, on or about 1 December, for control of all Allied air forces in the Mediterranean area under the command of Air Chief Marshal Tedder. Eisenhower, insisting that his problem was "immediate and critical" and "not to be confused nor its solution postponed by deliberate study of an overall

\* For a discussion of the proposed theater air force from the point of view of the North African theater, see above, pp. 60-66, 105-7.

system of air command," hoped that a stopgap arrangement with Spaatz acting as his deputy for air in North Africa would tide him over until such time as long-term plans could be made.<sup>36</sup> To Arnold and his staff in Washington, however, the problem remained one of achieving an eventual unification of all air efforts in Europe, Africa, and the Middle East.<sup>37</sup>

Indeed, General Arnold was no longer content merely to place all U.S. air forces operating against the European Axis under one command. He wished also to include those of the British under a single Allied air commander. On 10 December he put the problem to Sir Charles Portal:

The recent air operations in North Africa have confirmed my opinion that the United Nations air effort against the European Axis should be unified under the command of one supreme commander. At the present time we are carrying on an air war against Germany and Italy by more or less unrelated air efforts from the United Kingdom, North Africa, and the Middle East. Our efforts are being opposed by a very efficient air force, integrated by a very capable supreme air commander, Goering.<sup>38</sup>

In this, as in the matter of the over-all U.S. air command, Arnold had uppermost in his mind the strategic air offensive. To General Spaatz he wrote:

By appropriate unification of command the North African bases made available by TORCH . . . may be used to substantial advantage in the prosecution of our basic strategic plan for offensive air action against the European Axis. Without such unification the North African front is apt, I believe, to prove a seriously deterring factor in the effective employment of our air arm as a striking force.<sup>39</sup>

As if to emphasize the point of these last remarks, the foundations of Allied strategy were shifting once more in the direction of the Mediterranean. In November, Mr. Churchill had argued in favor of attacking the "underbelly" of the European monster, and the British chiefs of staff again registered their opposition to any plan for an invasion of western Europe before such time as Germany showed definite signs of weakening. It was their belief that Allied strategy should depend in the immediate future upon the strategic bombardment of Germany from the United Kingdom and an amphibious campaign in the Mediterranean to exploit TORCH.<sup>40</sup>

However welcome to the AAF may have been the emphasis on strategic bombardment, a project for exploiting TORCH was contemplated by the U.S. Joint Chiefs with profound misgivings. It had been a cardinal principle in U.S. strategic doctrine to defeat Germany

by a cross-Channel invasion of western Europe mounted at the earliest feasible moment. That invasion had been postponed once. Operations "subsequent to TORCH" would probably involve further postponement in favor of a campaign which, inasmuch as it did not contribute directly to the plans for the invasion of Germany, had to be considered an indecisive and therefore an inadvisable effort.<sup>41</sup> On 27 November the Joint Strategic Survey Committee assured the JCS that the basic United Nations strategy, as originally conceived, was sound. But on that same day a CPS subcommittee, appointed on 19 November to study the problem of further action in the Mediterranean, recommended exploitation of TORCH by means of a campaign against Sicily.<sup>42</sup>

To that proposal, the USAAF member of the subcommittee registered vigorous objection. With the RAF already and irrevocably committed to the large-scale bombing of German cities, the prospect of a post-TORCH venture in the Mediterranean raised a question, in the view of the AAF at least, chiefly of the further dispersal of American air forces. Admitting certain advantages in an attack on Sicily, the AAF representative maintained that "the heart of Germany's capacity to wage war is in Germany," that a strategic bomber offensive alone could at the moment strike effectively at that objective, and that any unnecessary diversion which would reduce the effectiveness of the bomber offensive should not be undertaken. Following a TORCH victory, he advocated that such forces as might be spared from the defense of Allied positions in the Mediterranean area should be made available for the strategic air offensive against the European Axis. North Africa should at the same time be developed as an efficient air operating area, auxiliary to the United Kingdom and capable of maintaining air units from the United Kingdom with a minimum transfer of ground personnel. In this way, Mediterranean shipping could be protected and Italian objectives could be bombed by long-range bombers during periods when weather in the north proved unfavorable to precision bombardment. It followed that North Africa and the United Kingdom should be considered as one theater, in which an extremely flexible air arm might be maintained on the perimeter of Axis Europe.<sup>43</sup>

As this paper indicates, the AAF had remained firm in its adherence to the principles set forth in AWPD-42. Only the strategic assumptions made by its authors had been changed with the passage of time. The Russian front no longer appeared in imminent danger of disintegrating,

and in a memo of 16 November for the JCS, General Arnold laid emphasis on Germany's mounting embarrassment rather than on her growing strength. Two indecisive Russian campaigns, together with the Allied invasion of North Africa and aerial bombardment from the United Kingdom, had weakened the enemy. All of which pointed to the immediate need of intensifying to the utmost the pressure against Germany so that she might be allowed no time for recuperation. This end could only be achieved by increasing the weight of strategic bombardment.<sup>44</sup>

The "Plan for the Defeat of the Axis Powers," drafted by AAF Headquarters on 1 December, again indorsed the soundness of current strategic commitments. Its authors insisted that Germany remained the principal enemy, that the only way to defeat her was by land invasion, that such an invasion could succeed only if preceded by strategic bombardment, and that the best if not the only opportunity for both air and land offensives lay in operations from the United Kingdom. Air operations should be aimed initially against the sources of German air and submarine strength, which constituted the chief immediate threats to Allied plans. When the German Air Force had been sufficiently reduced, the RAF would switch to day bombing in addition to its night operations. It was the optimistic hope of the authors that a combined bomber offensive, pressed to the fullest extent of Allied capabilities, would make an invasion of Germany feasible by the fall or winter of 1943.<sup>45</sup>

But further study by agencies of the Combined Chiefs of Staff served chiefly to reveal fundamental cleavages of opinion. On 30 December the subcommittee of the CPS to which the problem of post-TORCH operations had been returned in November reported to the CCS that it would be impossible to reconcile the divergent views until global strategy had been thoroughly reviewed.<sup>46</sup> The report gave formal expression to a need which many had recognized for some time. In the absence of clear strategic policy it was especially hard to plan for an operation such as the bomber offensive from the United Kingdom, which had been projected according to a long-range plan and, while having no immediate minimum requirement, could absorb any conceivable increase in air units.<sup>47</sup> And so it was that at the beginning of 1943 the hopes of the AAF for its program of strategic bombardment depended upon the outcome of the forthcoming conference of the Combined Chiefs of Staff with the two heads of state at Casablanca.

On 5 January, as has previously been noted,\* General Spaatz was placed in command of the newly created Allied Air Force in North Africa. In addition to his duties in that connection he held responsibility under Eisenhower for coordinating air operations between the Eighth Air Force and the Allied Air Force and for allocating, when necessary, replacement aircraft and crews among the Eighth Air Force, the Twelfth Air Force, and the Eastern Air Command.<sup>48</sup> The arrangement was weighted heavily in favor of the North African campaign. But it retained the principle of the complementary character of air operations in the two areas, Europe and North Africa. It did not, of course, attempt to provide for that over-all control of Allied air power for which General Arnold hoped, although, as he himself said, by unifying Allied effort in one area, at least it was a step in the right direction.<sup>49</sup>

By this time, in fact, events no longer pointed so imperatively toward a unified command for even the AAF units operating against the European Axis as had been the case during the earlier phases of TORCH. The drive for Tunisia had slowed down discouragingly, and the anticipated base areas for future strategic bombing of Axis objectives had not materialized. It no longer appeared likely that upon the successful completion of the North African campaign Eisenhower and Spaatz would be free to return to the United Kingdom for an invasion of western Europe in 1943.<sup>50</sup> "Operations subsequent to TORCH" were being discussed, and, under British pressure, it seemed probable that something of the sort would be undertaken in preference to an early campaign in northern Europe. As for Arnold's plan for a unified Allied air force, too many obstacles lay in its road. It required the prior existence of a supreme commander for all Allied forces operating against the European Axis and a roughly parallel organization and deployment of British and U.S. air forces, neither of which circumstances prevailed. The plan was apparently never presented to the CCS.<sup>51</sup>

The idea of the essential unity of air activity in the United Kingdom, North Africa, and the Middle East still flourished, especially in AAF Headquarters. It had been a useful concept in the fall of 1942; no doubt it had helped to keep the projected bomber offensive from being indefinitely postponed as a result of diversions to Africa and to the Pacific. It represented, too, a principle of command well suited to the extraordinary mobility of the air weapon. But it remained for the Casablanca conference to establish beyond dispute the right of the AAF to

\* See above, p. 110.



demonstrate what it could accomplish by strategic bombardment from the United Kingdom.

### *Aircraft Production Priorities*

For the AAF to implement its strategic doctrine, it was not enough to secure the necessary decisions concerning grand strategy. It was also a question of securing the means with which to operate. In a sense, of course, the problem of obtaining the aircraft required for the air offensive against Germany was really a part of the broader strategic problem. AAF requirements for defensive and supporting actions in all minor theaters could be established with relative ease. Requirements for the bomber offensive, on the other hand, stood or fell according to whether the project had or had not an unassailable place in Allied strategy. Regardless of strategic decisions, however, it remained a difficult task to assign priorities so as to make possible a large-scale air war in Europe without prejudicing other essential programs.

It had been early recognized that to carry out such an offensive as an effective action preliminary to invasion would require a large force of bombers and fighters. The requirements of the bomber offensive thus became the critical item in the aircraft production program which, when it had taken account of the minimum needs of other theaters and of training projects, had reached a startling figure. The 1942 production goal had been set at approximately 60,000 planes, of which 45,000 were to be of combat type. Of these 60,000 aircraft, 39,274 fell under Army cognizance, 10,190 under that of the U.S. Navy, and the rest were to be produced for the Allies.<sup>52</sup> By the fall of 1942 it was clear that the objective for 1943 would have to be much larger.<sup>53</sup> In addition to the fact that strategic considerations, being now more immediate than before, could be more accurately assessed, production had lagged behind stated requirements. Indeed, production reached a rate of 4,000 planes per month only in November of 1942.<sup>54</sup>

The authors of AWPD-42, the plan drafted in response to the President's request of 24 August for a statement of needs for "complete air ascendancy over the enemy," faced a difficult task. Requirements for air support in other theaters, being minimum and relatively easy to measure according to the nature of the land and sea action anticipated, needed little proof. But in the case of the bomber offensive it was necessary to demonstrate both the nature and scope of the projected operations in order to justify the size of force required; and as yet there

existed little data on which to proceed concerning precision bombing under combat conditions in the ETO. When the paper was begun, only the results of the first five missions flown by the Eighth Air Force were at hand. The job was finished in two weeks, which meant that at most the authors could have taken account of only the first ten heavy bomber operations flown from the United Kingdom by American planes. RAF and German experience provided useful supplementary information, but the task presented in the main an academic problem which the authors attacked with insight and realism.

Beginning with the confident premise that experience had "shown that it is perfectly feasible to conduct accurate, high level, daylight bombing under combat conditions, in the face of enemy antiaircraft and fighter opposition," the paper presented a specific plan for American participation in a combined bomber offensive. In order to realize the objective of crippling German economy at its nerve centers, it was estimated that it would be necessary to destroy some 177 targets, distributed among seven target systems. Assuming that direct hits with high-explosive bombs would do the job and that an average circular error of 1,000 feet from an altitude of 20,000 feet might be expected, the authors estimated the necessary bomb tonnage, and from that calculated the number of sorties required. The two-fold assumption that under European conditions five or six operations per month could be performed and that on the basis of British experience an average attrition rate of 20 per cent per month might be anticipated served then to fix a total requirement of 2,965 heavy bombers. If this full force could be made operational in the theater by 1 January 1944, the projected invasion of western Europe should be attempted in the late spring of that year. To be more specific, it was estimated that one-third of the preliminary task of strategic bombardment could be accomplished by the close of 1943 and that thereafter only four months of operations by the entire force would be required.

When to requirements for the bomber offensive against Germany there were added the minimum needs of air forces in other theaters, the result was an estimated 281 groups, or 63,068 combat aircraft, needed for all AAF operations up to, but not including, the combined assault on the continent of Europe. Of the 281 groups, approximately 78 would be necessary for operations from the United Kingdom. The addition of aircraft required for training and other noncombat purposes brought the total of AAF requirements for 1943 to 83,700

planes.<sup>55</sup> The Navy apparently had estimated its requirements to be in the neighborhood of 26,300 aircraft, a figure which included 1,250 Army-type land-based bombers of the long-range category. For these bombers the authors of AWPD-42 substituted in their calculation 8,000 trainers, thereby bringing all land-based long-range bombers under AAF cognizance, and entered the commitments to other United Nations at 22,440 planes. Thus, according to AWPD-42, the grand total of aircraft required from U.S. production for 1943 became 139,190.<sup>56</sup>

Subsequent events altered the basis for calculation only slightly. When, on 1 December 1942, the operational and strategic considerations affecting aircraft requirements again were reviewed, the general outlook seemed more optimistic. It was then claimed (without too accurate statistical evidence)\* that the Germans were losing 6 fighters for 1 U.S. bomber destroyed, instead of the conservative ratio of 2 to 1 tentatively suggested in AWPD-42. The date for the invasion of Europe was now advanced from the spring or summer of 1944 to the end of 1943, but estimates regarding aircraft requirements remained unaffected.<sup>57</sup>

AWPD-42 met stiff opposition from the outset. It was evident that an aircraft program of such magnitude would compete seriously with the Navy's shipbuilding program, and it was to be expected that the Navy would object to the allocation of all land-based heavy bombers to the AAF. Without stressing this latter point, Admiral King on 24 September rejected the plan in its entirety.<sup>58</sup> It was also clear that the aircraft program would compete with the Army ground program, especially in such heavy equipment as tanks, antiaircraft guns, and armored cars. Nevertheless, the AAF estimates received the approval of the War Department General Staff.<sup>59</sup> By 15 October (it is not apparent exactly at what earlier date) the President also had accepted them in substance and had included a slightly reduced figure of 131,000 planes as the principal item in a "must" program of war production for 1943.<sup>60</sup>

To this point, estimates had been based largely on strategic considerations. Now it became necessary to review the aircraft production program in the light of available resources. Productive capacity and the logistical factors depending on it placed a strict limit on the extent to which any strategic plan could be put into effect, and the aircraft program was no exception. Donald M. Nelson, chairman of the War

\* See above, pp. 221-24.

Production Board, had already called to the attention of Secretaries Stimson and Knox the fact that the production objectives for 1943 were considerably out of line with the productive capacity of the country. This point of view he presented to the JCS on 15 October 1942. Against U.S. capacity for producing munitions, facilities, and war construction during 1943, set in terms of dollars at roughly 75 billions, he placed the total military requirements for that year, which amounted to 92.9 billions. A substantial part of this military program had, however, been set by the President as an essential objective. The President's "must" items, comprising the aircraft program of 131,000 planes (37 billions), the merchant-ship building program (3.6 billions), the program for building minor combat vessels of the antisubmarine type (4 billions), production in fulfilment of the U.S.S.R. protocol (2.6 billions), and materials plants (1.5 billions), constituted over half of the total planned production. Consequently, while other items would almost certainly be delayed until 1944 for completion under such circumstances, the "must" objectives might also be unattainable unless revised.<sup>61</sup>

The JCS therefore agreed to propose a general reduction in 1943 requirements. The aircraft program, being by far the largest single item, became the crux of the entire discussion. General Marshall on 20 October expressed his concern that a decision regarding aircraft should be obtained immediately from the President. He pointed out that each day of delay would result in an appreciable loss of plane production. Accordingly he proposed that the 1943 aircraft program be reduced from 131,000 to 107,000 planes, of which 82,000 would be of combat type. He also was prepared to make even more significant reductions in such Army ground equipment as tanks, antiaircraft guns, and armored cars. Admiral King was advised that Marshall's proposal would not interfere with the proposed naval building program in any way.<sup>62</sup>

Acting on the advice of his chiefs of staff, President Roosevelt on 29 October instructed Nelson that the 107,000-plane objective "will be given highest priority and whatever preference is needed to insure its accomplishment." He indicated that the "Army, the Navy and other governmental agencies are to cooperate to the fullest in the furtherance of this program," adding that it was "really essential that in one way or another this program be carried out in toto."<sup>63</sup>

On the face of it, this directive would seem to have settled both the issue of air requirements and that of priority and preferential treatment

in production. It did settle the question of requirements to all intents and purposes. The revised 1943 military program, as approved by the JCS on 26 November 1942, reduced the total dollar value from 92.9 billions to 80.15 billions—which was believed to be an objective within the productive capacity of the nation. In this revised estimate, provision was made for 108,792 aircraft, representing a reduction of 3.73 billions from the figure originally quoted. Although other items of the President's "must" list did not suffer appreciable reduction and the Maritime program was actually increased by 25 per cent, those programs not underlined by the Chief Executive were drastically cut. This was especially true of the Army ground program and that part of the Navy building program not specifically given preference by the President.<sup>64</sup>

But the battle for priority, the competition for preferential treatment in allocation of critical materials, had only begun. AWPD-42 had warned that the aircraft production objective for 1943, upon which the success particularly of the bomber offensive depended, could be met only if it were given priority over all other programs. That recommendation had been made in the light of 1942 experience. Since early in that year, aircraft production had been assigned to Priority AA-1, but it had been forced always to share that category with substantial parts of the other major war programs.<sup>65</sup> Plane production had consequently been disappointing.<sup>66</sup> To avoid a similar result in 1943, it was necessary to arrange a priority system which would be more selective than any then in force. Above all, first priority must not be overloaded to an extent which would make the accomplishment of any top priority item a doubtful, perhaps an impossible, task.<sup>67</sup>

General Arnold therefore set out, as a matter of the utmost urgency, to secure a frankly overriding priority for aircraft production.<sup>68</sup> In that effort he received the hearty support of Lt. Gen. Brehon B. Somervell, who, as commanding general of the Services of Supply, was in a unique position to give practical counsel.<sup>69</sup> The Army planners as a body favored a revision of existing priorities which would place the aircraft program alone in the top bracket. They pointed out that a directive along such lines would not necessarily establish a fixed priority but would simply indicate where the primary emphasis should be placed. They appreciated the fact that certain other programs, listed by the President as "must" items for 1943, would be essential to the success of the air war as well as to that of the war in general. The authors of AWPD-42 had foreseen that vast quantities of shipping would be

needed to transport the air forces and to supply them. And, with German submarines undertaking a major strategic offensive operation in the Atlantic, it was evident that as large a force of escort and antisubmarine vessels as possible would have to be employed to insure the safe passage of personnel, equipment, and supplies. The priority proposed by the Army, in other words, was intended to build a balanced production program around aircraft as the most critical single item.<sup>70</sup>

The Navy flatly disagreed.<sup>71</sup> It had contemplated the aircraft program as outlined in AWPD-42 with unconcealed disfavor and had accepted the revised estimate apparently as the lesser of the proposed evils. According to Admiral King, he had given his approval only on the assurance that aircraft would not interfere with the Navy and Maritime projects which he believed essential to a balanced program of production.<sup>72</sup> So the Navy submitted a counterproposal which placed in first priority not only aircraft but all aircraft carriers, auxiliary carriers, and cruisers then scheduled for completion in 1943 and the first quarter of 1944, submarines due to be completed prior to 31 December 1943, such landing craft as must be completed to clear the building facilities for escort vessels, and finally the maximum number of tankers and escort vessels—in short, a major portion of the Navy and Maritime programs.<sup>73</sup> Navy spokesmen urged that these items, especially aircraft carriers and escort vessels, were not only necessary to supply the overseas air forces (as the AAF was perfectly ready to admit) but were actually of greater importance to the war effort than the grand total of aircraft.<sup>74</sup>

Be that as it may, the Navy's counterproposal would have had the effect of once more overloading first priority. General Arnold agreed to place critical items in the air, ground, naval and maritime programs in a parallel position under an AA-1 category on the advice of production experts who claimed that there would be no consequent interference with the production of the required aircraft for 1943. It soon developed, however, that such an arrangement would not only interfere with aircraft production but would make the 1943 air objective, on which the President had insisted, impossible to attain.<sup>75</sup> Rather than accord the necessary preferential treatment to aircraft, Admiral King advocated that the President be asked to withdraw his "must" program, and that he be guided entirely by priorities established by the JCS.<sup>76</sup> A compromise of sorts was reached on 26 November 1942 by which the President approved a No. 1 Group of critical items, including the



107,000-aircraft program, Army munitions requirements for the following six months, and substantial portions of the Navy and Maritime shipbuilding program. Although differing only slightly from the priority list against which General Arnold had registered his objection, the No. 1 Group received his approval. It is probable that by indorsing this paper, Arnold hoped on the one hand to avoid the delay and misunderstanding of protracted debate and on the other to secure a directive which, if not strictly satisfactory, was nevertheless broad and flexible and which would therefore permit a good deal of informal adjustment in putting it into effect.<sup>77</sup>

Nelson was asked at the same time to state whether or not this No. 1 Group could be accomplished. In his reply, dated 3 December 1942, he pointed out certain factors which seriously complicated the problem of producing all essential equipment on schedule. On the face of it, he wrote, it would seem quite feasible to produce in 1943 the No. 1 Group, estimated at 50 billions of dollars, for the total productive capacity of the nation amounted to more than 75 billions. But the limiting factor was not over-all productive capacity but certain critical machine tools and component parts. In addition, high priority had been accorded to such other projects as synthetic rubber, high-octane gasoline, and aluminum and alloy steel, all of which were in varying degrees required for the completion of the No. 1 Group items. It would be possible, he concluded, to produce the required aircraft by juggling the production of machine tools, but it would not be possible to complete all the No. 1 Group in 1943; nor could the aircraft program be completed if placed on a preferential basis equal to that of several other large segments of the 1943 war production.<sup>78</sup>

Thus the prospect for 1943 plane production continued to look uncertain. Many programs—the No. 1 Group, the rubber, high-octane gasoline, aluminum and alloy steel program, the Russian protocol and other export programs, and finally civilian supply and maintenance—all had a legitimate claim to the highest priority, and all had been given a “must” rating at one time or another by the government. It was, by the end of the year, evident that all could be accomplished concurrently in 1943, but not all completed on schedule. It was further clear that some could be completed on schedule if given preferential treatment over all others. Both General Somervell and Vice Adm. F. J. Horne, who had been engaged in surveying the problem, advised that aircraft could be given preference with less detriment to the rest of the

critical programs than if preference were given to any other single item. On the other hand, it appeared that the synthetic rubber and high-octane gasoline projects could only be accomplished at crippling expense to the rest.<sup>79</sup>

Lack of overriding priorities, especially in the use of critical materials, continued through the following months to handicap the aircraft production program. During January and February 1943, that program was reported to be 17 per cent behind schedule. And it was apparent that the 1943 objective would probably not be fully attained.<sup>80</sup> But the situation was not actually so serious as the welter of conflicting programs and priorities would seem on paper to make it. During the latter part of 1942 and early 1943, while the JCS were engaged in the futile and not very logical effort to establish which of a number of essential projects was most essential and to decide which of the President's "must" programs could in fact be accomplished, production was proceeding with no clear priority directive at all, except that aircraft were being given as far as possible an overriding priority in accordance with the President's directive of 29 October. In view of the favorable attitude taken toward the aircraft program by Nelson and the War Production Board, the AAF was willing to accept an informal preference in lieu of anything more satisfactory legally and to refrain prudently from raising the issue unnecessarily. By late April 1943, Robert A. Lovett, Assistant Secretary of War for Air, would be able to report in a letter to Air Chief Marshal Sir Arthur Harris that production was "coming along in grand shape."<sup>81</sup>

### *The Case for Bombardment*

The burden of proof in any discussion involving air strategy or aircraft production rested on the exponents of air power. This was particularly true of the American air strategists, who depended upon a yet largely untried tactical doctrine and who faced, in the U.S. Joint Chiefs of Staff, a divided opinion regarding basic strategy and therefore regarding the best use to be made of U.S. air power. That does not mean that the AAF was standing alone. The air program had been evolved in close cooperation with General Marshall and his planning staff and in principle enjoyed their steady support.

In the final analysis there was one way, and one way only, to present convincingly the case for air, and that was by direct reference to experience. But, for the time being, operations could not be expected to

speak entirely for themselves; and considering the restricted scale of current operations by the Eighth Air Force, it was necessary to present the case for AAF daylight bombing to the best possible advantage not only to U.S. war agencies but to the British as well. Headquarters, AAF, fully appreciated the critical character of the experiment being carried on by the Eighth Air Force, and its commanders shared this awareness. General Eaker referred feelingly to the missionary work being done by what he later called his "piddling little force of Fortresses." It might, he said, "affect the whole future of day bombardment in this war."<sup>82</sup> Accordingly, pertinent information on every mission that could be interpreted without falsification of fact as an air victory, or as a demonstration of the AAF doctrine of strategic bombardment, was at once relayed to Washington and there seized upon eagerly.

The initial operations of the VIII Bomber Command in August had come at an extremely opportune moment. American ideas of bombing and the American bombers themselves were being subjected to an increasing amount of skeptical attention. General Arnold was about to begin his fight in the JCS to prevent the diversion of air units to the Pacific, and AAF planners were in the process of estimating the air requirements for 1943 preparatory to issuing AWPB-42. On each account the VIII Bomber Command provided evidence of the utmost significance. The Lille attack of 9 October proved similarly useful. No sooner had the news reached Washington than a memo was prepared in AAF Headquarters for Harry Hopkins in which it was argued that the Lille mission "provides further proof of the soundness of the basic concept of AWPB-42, i.e., the effectiveness of properly exercised air power in destroying the ability of our enemy to wage war, and emphasizes the importance of maintaining to the full extent possible the vital air offensive against Germany."<sup>83</sup> This memo was forwarded to the White House in advance of the President's action that same month in favor of an overriding priority for the production of aircraft according to a program built solidly around the heavy bomber and in the spirit of AWPB-42.

It was not enough simply to welcome the dispatches which as a matter of routine brought useful news to headquarters. It was necessary to see that information flowed copiously and in the most useful form from the theater to Washington. In November, General Arnold sent to General Eaker an officer especially qualified for the task of "writing up and

presenting to the American people the true potentialities of air power which are factually supported by operations in your theater." "We must," Arnold wrote, "fully inform this country of the success that we have had with them [the heavy bombers] to date and point out forcibly that through their use from Europe in ever increasing numbers we can crush Germany's capacity to wage war at its source."<sup>84</sup>

It soon became apparent that some agency in AAF Headquarters should be made specifically responsible for digesting data regarding bombardment and preparing it suitably for presentation to the President, the JCS and CCS, the Office of Chief of Naval Operations, and interested members of Congress. On 25 November, the Directorate of Bombardment was ordered to establish the required agency, and certain specifications were laid down for its operation: "Data must be factual. Any resemblance to propaganda will defeat our purpose. The presentation must be such as will stir the imagination of the listener. It is necessary, therefore, that the data be prepared by persons with imagination, who have been trained in selling new ideas."<sup>85</sup>

In presenting the case for bombardment, which of course meant at this juncture the strategic bombing of Germany, the AAF received powerful support from the British, whose opinion, by virtue of their long experience both in receiving and delivering bombs, carried much weight. A paper prepared by Trenchard, Marshal of the RAF, arguing that air power must be applied independently in strategic bombing and not entangled with land campaigns undertaken in accordance with outmoded military doctrines, was widely circulated in the War Department and apparently had a good deal of influence on American strategic thinking.<sup>86</sup> On 13 October 1942, Air Cdre. S. C. Strafford wrote to Brig. Gen. O. A. Anderson, AC/AS, Plans, regarding the problem of preserving for the heavy bomber "its proper and vital place in the new air program," and inclosed certain documents embodying British doctrine on the subject which he hoped would be of some use in that direction.<sup>87</sup> Somewhat later, in November, Air Vice Marshal John C. Slessor brought a memo prepared by the British chiefs of staff to the United States for discussion with the JCS. This document, reflecting much of Lord Trenchard's ideas on air power and urging the creation of a great Anglo-American force of 4,000 to 6,000 bombers by April 1944 as a matter of the highest priority compatible with other essential projects, made a most favorable impression on Lovett. It was forwarded to Secretary Stimson on 15 November after having been

withdrawn from the JCS agenda because of Admiral King's protest that, since it had not been approved by the British Imperial War Council, it could not be considered official.<sup>88</sup>

The AAF also drew independently on British experience. On 1 November 1941, General Arnold had sent a board of AAF experts to England to study the effectiveness of German bombing, and it was their impression, supported by British opinion, that, had the enemy practiced systematic strategic bombardment as the British and American air strategists understood it and had they concentrated at an earlier date on vital objectives and followed up their attacks to a decisive conclusion, the results would have been fatal to the British war effort. Attention was further called in the fall of 1942 to the devastating effect of RAF area bombing. The 1,000-plane raid on Cologne of 30/31 May was believed, for example, to have destroyed approximately 12 per cent of the city's main industrial and residential areas.<sup>89</sup>

However, certain difficulties arose. The AAF was ready enough to cite the effectiveness of British area bombing when it was a question of demonstrating the place of a combined bomber offensive in the total strategic picture. The British effort had from the beginning been taken for granted as an essential part of a 24-hour-a-day bombing program calculated to bring continuous pressure to bear on the enemy. But there was the initial problem of demonstrating that the American bombing force was capable of supplying the daylight raids which were to constitute the other half of the combined offensive. It was, in other words, often easier to present the case for strategic bombardment in general than that of daylight precision bombing to which the AAF was committed more as a matter of faith than of knowledge empirically arrived at. The British had been carrying on a manifestly effective campaign of area bombardment according to more or less thoroughly demonstrated principles, and there was always a presumption in the minds of disinterested observers in favor of the American bombing force contributing to this established campaign rather than pioneering in unproved methods. More than that, precision bombing had been specifically and sharply questioned in the late summer of 1942 by the British press and by the U.S. Navy. Consequently a good deal of special pleading was done in behalf of precision techniques, and comparisons were sometimes drawn to the disadvantage of the British doctrine.

For example, when the news of the first bombing mission of the Eighth Air Force arrived in Washington, the chief of Air Staff ordered

a memo prepared for General Arnold's signature to General Marshall, for the attention of Admirals King and Leahy. The attack on Rouen, the resulting paper declared, "again verifies the soundness of our policy of the precision bombing of strategic objectives rather than mass (blitz) bombing of large, city size areas. The Army Air Forces early recognized that the effective use of air power *on a world wide basis* [underscoring in original] required the ability to hit small targets from high altitudes." It was not a doctrine, the memo continued, adopted capriciously. The war experience of all nations had been carefully studied, the difficulties in accomplishing precision bombing had been determined, and U.S. training, materiel, and tactics had been modified accordingly.<sup>90</sup>

This and similar statements were meant strictly for home consumption. Likewise for staff use only were a series of special studies, dated 19 October, prepared under the director of intelligence service at Headquarters, AAF, which undertook to analyze the British area bombing at Rostock, Cologne, and Osnabrück. The general conclusion reached was that bombing of this sort, while effective enough in producing general damage, was an unreliable and costly way of paralyzing the enemy's war machine and that, in comparison, precision bombing of a specific phase of the enemy's war economy according to a definite but flexible strategic plan afforded the most economical means of effecting a decisive concentration of bombardment effort.<sup>91</sup>

Apparently through no fault of the Air Staff, these studies finally reached the RAF with results described by General Eaker on 6 December as "most unfortunate." Eaker, in fact, considered them an unfair statement of the British effort, based as they were on inadequate information.<sup>92</sup> Although constantly interested in presenting a favorable case for precision methods, AAF Headquarters and American air commanders in the ETO were alike worried over the tendency of American observers, both civilian and military, to depreciate the British effort. They clearly understood that good Anglo-American relations were essential to the combined bombardment program, as well as to any other combined enterprise.<sup>93</sup>

At the same time, one of the most difficult tasks they faced was to sell daylight precision bombing to the British. British opinion had originally been deeply skeptical of the American doctrine, and, although British official sanction was given tentatively to the day bombardment program and the operational record of the Eighth Air Force had been



a revelation to most observers in England, opinion in the United Kingdom remained throughout the rest of 1942 in some doubt regarding the relative effectiveness of the American bombing. Indeed, when the daylight operations of the Eighth Air Force during the fall became seriously handicapped by the weather and when improved German fighter tactics and antiaircraft fire took increasing toll of the U.S. bombers, the question was asked with increasing insistence whether the VIII Bomber Command should not resort to area bombing by night and give up the vexing attempt to bomb pinpoint targets.<sup>94</sup>

This was but one of several fundamental questions pertaining to the bomber offensive confronted by the Casablanca conference when it met in the middle of January 1943. It had to define the place of that offensive in basic strategic plans, it had to clarify the mission of the bombing force, especially that of the Eighth Air Force, and it had to establish a formal system of control for the combined bombing operation.

The strategic decisions made at Casablanca reaffirmed the plans on the basis of which a combined bomber offensive had originally been conceived. First priority was given unequivocally to the war against the European Axis. To defeat Germany, it would be necessary to invade the continent of Europe in force. But Europe had still to be considered as a fortress which must be subjected to vigorous bombardment before the final assault would be practicable. Hence the combined bomber offensive remained a prerequisite to any major land operation against Germany.<sup>95</sup>

The planned invasion of the continent was postponed in favor of further amphibious and land operations in the Mediterranean area.\* Specifically, it was decided to take Sicily (Operation HUSKY) as a means of securing the Mediterranean lines of communication, of diverting German pressure from the Russian front, and of intensifying pressure on Italy.<sup>96</sup> Tentative agreement on this strategy was reached only after much debate. The U.S. JCS had consistently opposed Mediterranean "operations subsequent to TORCH" as merely another step in an indecisive and costly encircling action, and had demanded that Allied forces, both air and surface, be concentrated for a decisive push in western Europe against the heart of Germany. The British chiefs of staff, on the contrary, while insisting on the maximum application of Allied strategic air power against Germany proper, preferred to post-

\* See above, pp. 113-14.

pone cross-Channel operations in favor of an offensive in the Mediterranean in the hope of seriously dispersing German strength. Certain logistical factors favored the British policy. Chief of these was the fact that the Allies already had large forces in North Africa ready for further operations in the Mediterranean once TORCH had been completed, and it would greatly ease the critical shipping problem if those forces could be utilized without having to be transported to the United Kingdom. The American delegation appreciated this economy of tonnage and admitted the additional advantages offered by a successful HUSKY.<sup>97</sup>

The AAF had consistently supported the views advanced by the American Joint Chiefs at Casablanca. Yet, in a very real sense the decision in favor of HUSKY, by allowing more time for the systematic application of strategic air power, enhanced the position of the bomber offensive as an independent operation. It would be possible, as the British pointed out, to concentrate a larger force of heavy bombers in the United Kingdom than if an early invasion of the continent were contemplated.<sup>98</sup> There would be less immediate need for the build-up of ground support forces, a build-up that could have been accomplished on the scale required for a continental invasion only at some expense of heavy bombardment. It should be noted too that the decision to postpone the invasion placed it at a time more nearly corresponding to the schedule set in AWPD-42. If there was general disappointment among the Americans over the decision in favor of the Mediterranean strategy, there was for the AAF cause for gratification in the simultaneous decision to mount the "heaviest possible bomber offensive against the German war effort."<sup>99</sup>\*

There was more at stake for the AAF, however, than questions of strategy. Doubt continued to exist regarding the capabilities and tactics of the American bombing force, and, apparently under the leadership of the Prime Minister, pressure was brought to bear to have the heavy bombers of the Eighth Air Force join the RAF in its night bombing campaign. General Arnold, facing the necessity of presenting the case for daylight bombardment in some detail, summoned General Eaker, whose experiences gave him special qualifications, to defend the U.S. doctrine.<sup>99</sup>

Eaker began his defense of the American tactics by maintaining that only one convincing argument had ever been advanced for night

\* See again, pp. 209-11, 277-78.

bombing over day bombing and that was that it was safer. But in point of fact the Eighth Air Force rate of loss in day raids had been lower than that of the RAF on its night operations, a fact that was explained in part by the great improvement in German night fighter tactics and in part by the heavy firepower of the American bombers. If the day bombers were made to operate by night their losses, as a result of both enemy action and operational hazards, would increase materially, for they were neither equipped nor trained for that sort of work. To equip and train them would cause untold delay. Of even greater importance was the fact that day bombing, regardless of the question of safety, could do things that night bombing could not. The day bombers could hit small, important targets such as individual factories which could not be found, seen, or hit at night. Their accuracy in such attacks Eaker estimated at about five times that of the best night bombing, thanks to the excellent bombsight they carried. Hence day bombing tended to be more economical than night bombing, for a force only one-fifth as large would be required to destroy a given installation. Eaker of course admitted that the objective of night bombardment was not primarily the destruction of individual targets but the devastation of vital areas, and as such it could not properly be compared to precision bombing on the ground of accuracy. But that introduced another point of the greatest significance: day bombing and night bombing were ideally calculated to supplement each other. By employing both it would be possible to bring continuous, 24-hour pressure to bear on the enemy, thus preventing his defenses from relaxing. It would also be possible, in many cases, for the AAF to locate difficult targets and mark them by the fires resulting from their preliminary bombing, and so make it feasible for the RAF to complete the job at night. Furthermore, the day bombing program reduced airdrome, air space, and communications congestion in the United Kingdom, where space was at a premium. Finally, day bombing would permit the destruction of German day fighters. It was, Eaker felt, the most economical method of reducing German air strength because the enemy would have to send up his fighter planes to protect vital objectives even when he would not commit them to battle with Allied fighter forces.

Eaker's presentation of the case for daylight bombardment was followed by many questions. Why had there been so many abortive sorties? Why had there been so few missions? Why should the U.S. bombers and those of the RAF not be given the same directive and the

same targets? Why had U.S. bombers not bombed Germany? In answer, he described the factors that hitherto had limited the activity of his bombers: the relative inexperience of the crews; the requirements of TORCH which had seriously bled the Eighth Air Force and which had diverted the efforts of much of the force remaining, especially of the service units; the weather during the fall and winter months which had both limited the number of missions and increased the incidence of abortive sorties; the current strategic directive which, by limiting the bombers to submarine bases and related targets in the occupied countries, reduced the choice of operating areas, thereby intensifying the weather problem; the lack of long-range fighters for escort into Germany. All of these difficulties could, he claimed, soon be mitigated. Crew experience would automatically increase, TORCH should soon require less of Eighth Air Force strength and time, strenuous efforts were being made to develop blind-bombing tactics to circumvent bad weather, long-range escort appeared in sight, and by enlarging the scope of Eighth Air Force bombing operations to include targets in Germany proper, the CCS could do much to relieve the American force from a strategic policy which, however necessary, had proved embarrassing both operationally and politically.<sup>100</sup>

On this latter point, General Eaker went on to say that so far from avoiding German targets he believed they should in the near future be given a high priority for day bombardment. Missions to Germany, by scattering enemy defenses and augmenting the present RAF effort, would contribute strategically to the success of the air war. They would also contribute to the improvement of Eighth Air Force morale and at the same time would undermine that of the German civilian population. He would, he claimed, be ready by 1 February with a force of 100 heavy bombers and 100 fighters to carry the day bombing campaign to the enemy homeland. If TORCH no longer needed the entire strength of the Eighth Air Force in its support, then it was time another directive were issued more in line with the strategic situation in north-western Europe. Eaker insisted that, since TORCH possessed its own adequate air force, target directives should be issued either by the chief of Air Staff, RAF, or by the CCS, rather than by the supreme commander of Operation TORCH.<sup>101</sup>

The chief testimony to the effectiveness of the above arguments lies in the fact that the day bombardment program was subjected to no further question. But its future also depended to a considerable extent

on the system of command under which the day bombers were placed. Eaker tacitly recognized that fact when he advocated placing operational control—meaning the determination of over-all target priority only—in the hands either of the chief of Air Staff, RAF, or of the CCS themselves. He appears to have been especially anxious to avoid complete integration of command over the American and British bomber forces such as had been accomplished for the TORCH air forces by Eisenhower. In that event the commander in chief of RAF Bomber Command would naturally be placed in charge of the combined force, and Eaker had reason to believe that Air Marshal Harris would probably favor transferring the American bombers from day to night operations.<sup>102</sup>

To insure for the American commander full control over the methods employed by his force thus came to be the keynote of U.S. policy as far as the bomber offensive was concerned. General Marshall, speaking for the U.S. Joint Chiefs suggested that the American bombers in England should be under the operational direction of the British, who would prescribe the targets and the timing of attacks; but he insisted that operational procedure and technique for the American force should remain the prerogative of American commanders. General priorities should be prescribed by the CCS. British command, he felt, was logical until such time as the U.S. air forces outnumbered the British and until they had demonstrated beyond any shadow of doubt the efficacy of their daylight bombing methods, at which time a re-examination of command arrangements would be in order. This point of view was accepted by the British without apparent opposition.<sup>103</sup>

When it came to deciding the main objectives for the combined offensive, two considerations stood out in bold relief: the submarine remained the principal threat to Allied operations in the west, and the German Air Force would have to be defeated before Germany could be successfully invaded or even subjected to decisively effective strategic bombardment. The gravity of the submarine problem needed no new proof. The figures on shipping losses incurred in the course of this transoceanic war sufficed to make defeat of the U-boat unquestionably a "first charge on the resources of the United Nations." And it was agreed that intensified bombing of submarine operating bases and construction yards should be carried out by the combined bomber force, with immediate attention being devoted to the Biscay bases.<sup>104</sup>

As for the Luftwaffe, it was currently believed to be in a critical state. The stamina of its crews was reputed to be decreasing, its training

indifferent, and its morale low. There was supposed no longer to be any depth of reserves behind the first line of fighter defenses. Consequently decisive action should be taken at once to reduce the GAF before it had a chance to recuperate. It was recognized that German air power could in effect be reduced by dispersion, in which case the American daylight bombers could probably be used more profitably to harass the GAF from bases in North Africa than to conduct strategic bombing operations from the United Kingdom; and in the early days of the Casablanca conference it was still an open question whether the American force might not better be deployed in that direction. But the GAF could also be reduced, and ultimately more effectively, by destroying German aircraft production and base facilities and by forcing the enemy fighters to engage in a war of attrition with heavily armed formations of day bombers. For these operations the United Kingdom provided the only suitable base available. It was therefore decided to concentrate in the United Kingdom both the British and the American bombing forces.<sup>105</sup>

In a sense, of course, U-boats and aircraft constituted objectives of intermediate rather than of final importance. The final objective remained the enemy's total war potential. American airmen were still confidently of the opinion that, by precision attacks on "bottleneck" industries, German production could be paralyzed. British bombardment experts on the other hand continued to emphasize enemy morale.<sup>106</sup>

On 21 January 1943, the CCS issued CCS 166/1/D, usually referred to as the Casablanca Directive, for the bomber offensive from the United Kingdom. The ultimate objective of that offensive was stated to be "the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened." The primary objectives for the time being were listed in the following order of priority: (1) German submarine construction yards, (2) the German aircraft industry, (3) transportation, (4) oil plants, and (5) other targets in enemy war industry.

In addition to these priority objectives, which were subject to alteration from time to time as the strategic situation developed, other targets were mentioned as "of great importance either from the political or military" point of view. First of the examples mentioned in this connection were the submarine bases on the Biscay coast which the Eighth



Air Force had been attacking sporadically for the past three months. The CCS had decided not to include them in the order of priority because that list was meant to cover long-term operations only. The bases were moreover not situated in Germany, and since the American force in the past had been severely, if unjustly, criticized before British public opinion for devoting so large a portion of its effort to objectives outside Germany proper, it had been considered wise to treat the Biscay bases in a special category.<sup>107</sup> Nevertheless, the CCS made it perfectly clear that those bases were still targets of the highest strategic value. And, if it were found that the maximum pressure applied to them for an appreciable time produced decisive results, the attacks should continue whenever conditions were favorable and for as long and as often as necessary. Provision was also made for bombing such essentially political objectives as Berlin, for attacking, when the time came, targets in northern Italy in connection with amphibious operations in the Mediterranean theater, and for action against any unforeseen but important objectives. When the Allied armies re-entered the European continent, the combined bomber force would afford them all possible support in the manner most effective.

The directive gave a specific place to the day bomber force which, it stated, should "take every opportunity to attack Germany by day, to destroy objectives that are unsuitable for night attack, to sustain continuous pressure on German morale, to impose heavy losses on the German day fighter force and to contain German fighter strength away from the Russian and Mediterranean theatres of war." In another provision affecting primarily the American force, it specified that in attacking objectives in occupied countries the attacking force would conform to "such instructions as may be issued from time to time for political reasons by His Majesty's Government through the British Chiefs of Staff." This provision was meant to answer a peculiar problem. Political considerations, it had been argued, often superseded military expediency in the case of objectives in occupied countries. The British government or representatives from one of the exiled governments sometimes placed a political embargo on certain otherwise excellent military targets. In such cases decisions had often to be taken very quickly, and it would not be practicable to deal with the matter through the CCS in Washington.<sup>108</sup>

Oddly enough, the Casablanca directive made no mention of the system of command under which the combined offensive was to be conducted. Except that it was issued by the CCS "to the appropriate British

## THE CASABLANCA DIRECTIVE

and United States Air Force Commanders, to govern the operation of the British and United States Bomber Commands in the United Kingdom," it leaves the reader quite in the dark regarding the machinery of control. Very probably the omission was intentional, for CCS 166/1/D is primarily a strategic directive. But the lack of any specific paper on the subject of command seems to have caused some confusion. On 2 February 1943 the British Joint Staff Mission proposed to the U.S. Joint Chiefs that the chief of the British Air Staff should assume "forth-with" the responsibility for carrying out the combined bomber offensive as decided upon at Casablanca, and that his first act should be to issue to the commanding general of the Eighth Air Force "the agreed directive (CCS 166/1/D)," <sup>109</sup> a suggestion which is somewhat surprising inasmuch as the paper in question was already addressed to "the appropriate British and United States Air Force Commanders."

The secretary of the JCS replied by referring to the agreement reached in CCS 65th meeting, 21 January 1943, at Casablanca. On General Marshall's motion it had then been agreed that control of bomber operations conducted by the U.S. air forces in the United Kingdom would be in the hands of the British as a "matter of command rather than agreement with the U.S. Commanders." It would, however, "be the responsibility of the U.S. Commanders to decide the technique and method to be employed." A message including this information was dispatched on 4 February to the commanding general of U.S. forces in the United Kingdom. Other than that, no directive appears to have been issued. <sup>110</sup> Meanwhile, of course, the responsibility for the combined bombardment operation fell naturally upon the chief of the British Air Staff, Sir Charles Portal, and it was he, as agent of the CCS, who directed it for the rest of 1943.

The Casablanca conference did much to clear the strategic atmosphere, especially in regard to the use of air power. It was thereafter possible for Allied strategists to plan with new assurance and to think with new clarity. But the work of the conference was done on the level of general policy; although it laid down guiding principles, it did not entertain specific plans. Even the directive for the bomber offensive provided only a general indication of policy and its target priority list gave only tentative direction. <sup>111</sup> It became the task of the succeeding months, culminating in the TRIDENT conference of May 1943, to translate the Casablanca decisions into terms of specific commitments and detailed objectives.

## CHAPTER 10

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### *OVER GERMANY*

**A**LTHOUGH the Casablanca directive clearly stated the mission of the combined bomber force and provided for it a tentative list of priority target systems, the Combined Bomber Offensive (CBO) is not customarily dated from 21 January 1943. Rather it is considered to have begun with the directive of 10 June 1943, issued after detailed plans had matured and the American force had been substantially augmented. Between those dates, Eighth Air Force operations continued to be essentially experimental. The American bombers were engaged in extending the scope of their effort into Germany proper, in feeling out the quality of German opposition, itself desperately experimental, and in adjusting their tactics and techniques to the broader plan and increased scale of the daylight operations projected by the Combined Chiefs of Staff. It is this progressive mastery of the problems of strategic bombardment over Germany that characterizes this new phase of Eighth Air Force activity more than the weight or even the effectiveness of the operations themselves.

The fact was that the strength in effective aircraft did not increase so rapidly as had been hoped. Allied air strategists understood that, in order to put the proposed combined offensive into effect, it would be necessary to have a sufficient force ready to strike enemy installations as soon as the fine spring weather made heavy daylight operations feasible. But it was not until May that the build-up of the American force began in earnest. Meanwhile, the Eighth Air Force continued to fight a battle of critical importance with too few bombers for economical operation. During the months of January, February, and March, its average combat strength sank lower than at any time since October 1942; in February it could claim an average daily combat strength of only seventy-four operating combinations (combat crews and air-

craft). It was not until March that a force of more than 100 bombers could be put into the air with some consistency. The situation improved somewhat in April, yet up to the end of that month six operating groups (four B-17 and two B-24) remained the total effective bombing strength. Moreover, prior to 8 April, the 4th Fighter Group, re-equipped in March with P-47's, was the only U.S. fighter unit consistently available.<sup>1</sup> During April two more P-47 groups became operational and in May began to escort the bombers regularly. By the end of that month operating strength in bombers had gone up to twelve heavy groups, and on 29 May a record force of 279 bombers was dispatched against the enemy objectives.<sup>2</sup> But as these facts indicate, it was not until May that the Eighth Air Force began to acquire the strength appropriate to its mission.

Meanwhile, the difficulty experienced was greater than that occasioned merely by failure to acquire additional operational units. A more immediate and acute problem was that of replacements. During the winter months the Eighth Air Force had been starved in this respect because of the insatiable demands of the TORCH operation, and by February attrition was beginning to wear down the operating groups to an alarming extent. This was especially noticeable in combat crews where total effective strength suffered not only from actual combat losses but from war weariness. Prior to the first of February, the Eighth received only twenty replacement crews as against sixty-seven lost, and it was estimated that by March seventy-three combat crews would have to be considered war weary. Spring found some of the groups down to 50 per cent strength, with the fatal statistics of attrition undermining the morale of the remaining crews. During 1942 crew availability had not seriously limited the force that could be put into the air at any given time. Beginning with February, however, the situation changed appreciably, and from then until May availability of trained crews generally governed the number of bombers that could be dispatched.<sup>3</sup>

With this situation in mind, General Eaker and Lt. Gen. Frank M. Andrews, who had succeeded General Eisenhower on 5 February as commander of ETOUSA, urged the War Department to accelerate the air build-up in the United Kingdom in any way possible. It was, they argued, essential that the Eighth Air Force be increased at once to permit the simultaneous dispatch of at least 300 heavy bombers, an objective which would require an estimated 600 to be on hand in the

theater. These figures were not dictated by the ultimate requirements of the combined offensive but by the nature of the immediate task. It became apparent by April 1943 that German fighter strength in the west had been augmented by increased production and by the transfer of units from Russia and the Mediterranean, and a force of 300 planes was considered the minimum that could operate economically and effectively in the face of this growing fighter opposition. Moreover, a basic strength of 600 planes was held necessary to insure continuity of action against vital German targets. Until it could be attained, the day bombers could only "nibble at the fringes of German strength" and inadequately exploit German weaknesses.<sup>4</sup>

The British expressed even more profound concern regarding the rate of the build-up of the U.S. day bomber force. Air Chief Marshal Portal in letters to General Arnold (though intended less for him personally than for the JCS)<sup>5</sup> repeatedly emphasized the strategic importance of the day and night bomber offensive. Continued Soviet successes, together with the hard struggle in the Mediterranean, had given the enemy a fundamental shock, and it behooved the Allies to do everything in their power to prevent him from recovering. The only weapon available for the purpose, Portal maintained, was the bomber force, of which the American day bombers constituted an essential part. The operations of the Eighth Air Force had been "strikingly successful," considering the limited number of planes General Eaker had been able to put in the air. But therein lay the problem. "My one fear is that their efforts may be curtailed or even brought to a standstill by lack of numbers." Portal then added a warning, of special significance to American ears. If, despite the build-up to date and the proved keenness of the American units, the efforts of the Eighth Air Force should come to nothing as a result of lack of numbers, it would greatly strengthen the arguments of those who advocated an increase in night bombing "rather than the combination of day and night attack in which you and I so firmly believe."<sup>6</sup>

Several factors, however, operated during the period prior to May 1943 to retard the flow of replacements and new units to the Eighth. It must be remembered that the build-up of that air force (a project now commonly referred to by the code name SICKLE) was peculiarly subject to external influences. Admittedly the largest in the entire AAF program, the project was scheduled to receive all heavy bombers not specifically required in other theaters.<sup>7</sup> That, of course, meant that

any increase in the essential requirements elsewhere would immediately affect the bomber force in the United Kingdom. Consequently, diversions to other theaters continued to be a factor which only the fortunes of war could determine. Two B-17 groups, the 99th and the 2d, which had been scheduled as the February quota for the Eighth Air Force, were diverted to the Twelfth in North Africa. A group of B-24's, the 308th, originally destined for the Eighth, was sent in March to the CBI theater. Also in March it was decided to reinforce the Southwest Pacific by one of the B-24 groups out of the May quota to the United Kingdom.<sup>8</sup> In addition to these diversions, the mounting antisubmarine war in the Atlantic put an increasing strain on B-24 resources, thus further delaying the flow of that type to the Eighth Air Force.<sup>9</sup>

Each proposed diversion met stiff resistance on the part of Andrews and Eaker in the theater and of Arnold's staff in Washington.<sup>10</sup> The argument for a speedy augmentation of forces in the United Kingdom in time for the lengthening days of spring and summer was a cogent one. But overriding strategic considerations, coupled with considerable pressure exerted in favor of the Southwest Pacific and Asiatic areas, in most instances forced the issue.<sup>11</sup>

Diversions undoubtedly reduced over an extended period of time the availability of bomber units for commitment to the United Kingdom. But it does not appear that lack of availability acted as the immediate determining factor in the slow growth of the day bomber force during the spring of 1943. There was actually an average daily strength of 337 heavy bombers on hand within the theater in April 1943, 231 in tactical units.<sup>12</sup> Yet the fact remained that the Eighth Air Force during April still operated with but six heavy groups, which provided a fully operational, average daily strength for the month of only 153 planes.<sup>13</sup> So the delay in creating even a moderately effective striking force in the United Kingdom between January and May 1943 must be explained with reference to certain contingent factors, chief of which was the lack of available shipping for the transport of ground personnel.\*

### *The Strategic Contribution*

Small though the forces were, the operations of the Eighth during the first half of 1943 were by no means negligible. The day bombers continued to devote their attention primarily to submarine installations. They were still charged with carrying out a policy which dated from

\* See chaps. 18 and 19 for detailed discussion.



the fall of 1942 when shipping losses, especially in the Atlantic convoy lanes, had begun to assume alarming proportions.\* It will be recalled that, since 20 October 1942, the Eighth had been under orders to attack the submarine operating bases as a matter of first priority. On 19 November the submarine building yards at Vegesack, Bremen, and Kiel had been added to the day bombardment program as top priority objectives,<sup>14</sup> but before January 1943 it had not been considered feasible to attack targets in Germany proper. At Casablanca it was decided to throw the primary emphasis of the combined offensive against submarines, concentrating especially on the bombing of the building yards in the Reich. The operating bases on the French coast were to continue to be subjected to bombardment until it might be conclusively determined whether or not they constituted a profitable system of objectives. On that score both British and American observers entertained profound doubts. It was generally conceded that the roofs of the submarine shelters, constructed as they were of reinforced concrete sometimes over a dozen feet thick, were impervious to any projectiles then available. But many still hoped that by disorganizing the service installations, transport facilities, and laboring population in the port areas the turn-around of U-boats in the operating bases might be slowed down to such an extent that the number of U-boats actively engaged in the Allied shipping lanes would be in effect reduced.<sup>15</sup>

Accordingly, the Eighth Air Force and the RAF continued to strike at the Biscay bases, especially Lorient and St. Nazaire. Generally speaking, the day bombers attacked the French bases only when weather conditions made missions to the German shipbuilding ports impracticable—which circumstance, of course, still left them ample opportunity.<sup>16</sup> As for the U-boat construction yards, it was conceded that their destruction would have only a very delayed effect on the operating strength of the U-boat fleet, but it was considered that the submarine had become so serious and chronic a menace that it warranted long-term measures. Meanwhile, attacks on the U-boats at sea were coming to be recognized in some quarters as the most direct and possibly, in the long run, the most effective method of coping with the submarine counterattack, but it was felt that they needed to be supplemented by attacks on the submarines at their point of origin. In addition, the British, while admitting that the component parts industry did not constitute by itself a suitable target for strategic bombardment,

\* See above, chap. 8.

hoped that by means of area bombing of key manufacturing centers significant delay might also be effected in the delivery of essential components as well as in the production of such basic materials as steel. Also intended as of indirect significance in the antisubmarine bombing campaign were attacks on enemy transportation as a whole, especially on the vulnerable supply lines extending from the Low Countries to the Atlantic coast.<sup>17</sup>

It was, then, a relatively large and coordinated attack that the combined bomber forces launched against the sources of the U-boat menace during the first half of 1943. More than 63 per cent of the total tonnage of bombs dropped by the Eighth and 30 per cent of that dropped by the RAF during the first quarter of the year were directed specifically toward submarine facilities. In the second quarter, 30 per cent of the RAF and 52 per cent of the American effort were so expended. These figures do not, of course, include the weight of attack applied against transportation, civilian morale, and basic industry, all considered to have an indirect, albeit an incalculable, bearing on the main issue.<sup>18</sup>

Until August 1943 the German submarine industry was not a separate entity. Rather it functioned as an integral part of the shipbuilding industry, which, however, was converting a rapidly increasing proportion of its facilities to the construction and maintenance of underwater craft.<sup>19</sup> In addition to heavy RAF raids against facilities at Emden, Wilhelmshaven, Kiel, Hamburg, Flensburg, Lübeck, Bremerhaven, and other construction centers, the Eighth Air Force, from 23 January 1943 to June of that year, executed twelve separate attacks against submarine construction yards. Seven of these operations resulted in appreciable damage to the target. The day bombers struck four effective blows at Wilhelmshaven, where the submarine construction yard at the Marinewerft constituted the most interesting of a number of important naval targets. It was not always easy to distinguish the effects of Eighth Air Force attacks from those of the RAF, but photo reconnaissance revealed heavy, though scattered, damage to installations in the port area. The last of these missions, conducted on 21 May, was believed to have been especially effective, extending the areas of damage already inflicted and contributing to a general reduction of submarine construction capacity from sixteen hulls to less than eight. On 14 May, 126 bombers dealt considerable damage to two of the submarine yards at Kiel—Germania Werft and Deutsche Werke. Almost every major building

in the former received damage, some of it severe; destruction at the latter concern, though less extensive, was substantial.<sup>20</sup>

Probably the most significant and certainly the most dramatic attack made during these months was executed on 18 March against the yards of Bremer Vulkan at Vegesack. Situated on the right bank of the Weser River, some seven miles below Bremen, that yard had been engaged since mid-1940 entirely in submarine building. At the time of the bombing the slipways contained fifteen submarines in varying stages of construction. Photo reconnaissance after the raid revealed a most favorable picture of the destruction wrought. It had been an unusually accurate job of bombing, and of the fifteen U-boat hulls on the slips it appeared that seven had been damaged severely, one having actually capsized. Six others were thought to have been slightly damaged. Judging from the extent of the destruction, Allied observers believed that instead of completing seven submarines during the ensuing six months, as apparently planned, the yard would probably finish only four; and they estimated that Bremer Vulkan would be of little importance for at least twelve months.<sup>21</sup>

But this more than normally efficient attack illustrates both the limitations of photo reconnaissance and the difficulty of doing permanent damage to shipbuilding yards. Information gained subsequently from German records indicates that, although interpretation reports were accurate enough in identifying the points of damage inflicted on the yard and on the unfinished U-boat hulls, they quite failed to measure the quality of the destruction and consequently overestimated its effect on production. Actual damage suffered by the submarines on the slipways was slight, for most of the bombs that hit the ways either broke open, with resulting low-order detonations, or penetrated below the concrete and were dissipated underground. Damage to the camouflage over the submarines caused destruction of the vessels themselves to be overestimated from the air. In reality only a few holes from fragments resulted. The interpretation reports failed also to appreciate the recuperative capacity of submarine plant facilities. For, despite the admittedly severe damage to buildings and equipment (the company claimed compensation to the extent of RM 4,365,470), considerable productive activity was resumed at the yard after one week, and within six weeks production had returned virtually to normal.<sup>22</sup>

A similar story may be told of the entire effort against the building yards during the first half of 1943. Although comparatively heavy, the

attacks of the RAF and USAAF had in fact little effect on production of submarines. Only in the last months of the war did submarine production fall off seriously, and then the paralysis of the industry stemmed in part from a vastly increased weight of attack and in part from the general disruption of transport facilities which in those latter days affected all enemy industry.<sup>23</sup>

Even more frustrating to Allied hopes were the attacks made against the operating bases on the French coast, for it now appears that these attacks had practically no effect on the activity of the U-boat fleet at any period, no matter how much inconvenience and ultimate expenditure of materiel and manpower they may have occasioned.<sup>24</sup> It is true, of course, that the sub bases were treated during the first half of 1943 as targets of secondary importance in comparison with the building yards. But they were nonetheless subject to a crushing weight of bombs. Of the total bombs dropped by the Eighth Air Force on submarine and naval objectives from 23 January to 10 June 1943—amounting to well over 3,800 tons—approximately 1,645 tons fell on the operating bases. Of thirteen separate attacks, nine may be considered successful; and of these successful blows, four were inflicted on Lorient, three on Brest, and two on St. Nazaire.<sup>25</sup> In addition to this weight of USAAF daylight attack, the RAF Bomber Command conducted a vigorous campaign of night raids, concentrating mainly on Lorient and St. Nazaire. Between 14 January and 16 February the British bombers hurled nine night area attacks at the town of Lorient, three of which were executed by forces of from 300 to 500 planes. Late in February they turned their attention to St. Nazaire, delivering even more concentrated destruction to that unhappy town than to Lorient.<sup>26</sup>

The results of this combined effort, coming as it did on top of repeated bombardment of bases during the fall of 1942, were truly devastating. By the end of March 1943 destruction was already widespread in the town areas as well as among the port installations, railway facilities, and public utilities, and it was becoming evident that both St. Nazaire and Lorient were rapidly becoming uninhabitable by the ordinary civilian population. By the end of May not a single important building in St. Nazaire remained intact, and many had suffered serious and lasting damage. Repair work had been persistently attempted but had not been able to keep pace with the bombing.<sup>27</sup> Grand Admiral Doenitz summed up the situation with some finality in a meeting of the Central Planning Office on 4 May 1943: "The Anglo-Saxons' attempt

to strike down the submarine war was undertaken with all the means available to them. You know that the towns of St. Nazaire and Lorient have been rubbed out as main submarine bases. No dog nor cat is left in these towns. Nothing but the submarine shelters remain."<sup>28</sup>

But the submarine shelters did remain, and constituted an obstacle to Allied bombing that proved for all practical purposes insurmountable. As Doenitz went on to say, they had been built by the Todt organization as a result of the "far-sighted orders of the Fuehrer," and the submarines were repaired entirely beneath the protection of their concrete. Instead of abandoning the bases, the Germans had moved all essential facilities inside the pens.<sup>29</sup> And so the Allies were doomed to disappointment in their hope, persistently held, that destruction of repair shops, power plants, living quarters, and other port facilities could be counted on to increase the turn-around time necessary before a U-boat could again become operational. In the absence of conclusive evidence (the work of the bases was shrouded in the deepest secrecy),<sup>30</sup> that hope remained fresh and green for some time. Despite an occasional report from European sources to the effect that the submarine shelters were working uninterruptedly, an AAF intelligence report dated 1 July 1943 stated confidently that "it is increasingly difficult for the enemy to turn around their submarines on scheduled time." The Admiralty, it continued, had just written to the chief of the U.S. Air Staff pointing out the great value of these attacks and requesting that they be continued. "There is no doubt whatsoever that they have contributed materially to the marked diminution of the U-boat effort and the resultant reduction in our shipping losses."<sup>31</sup> By the end of the year, however, Allied intelligence analysts had already begun to take a more conservative view of the bombing of operating bases.<sup>32</sup> As for the pens themselves, they remained impervious to anything but the six-ton bombs dropped occasionally in the later stages of the war by the RAF.<sup>33</sup> But by that time the antisubmarine war had been won, and by other means than strategic bombardment.

The submarines suffered substantial defeat in the late spring of 1943, and it now appears that their failure resulted primarily from improved Allied detection methods, convoy techniques, and sea and air antisubmarine warfare on the high seas. According to Admiral Doenitz, who, as commander of the U-boat fleet, was in a position to speak with authority, it was air attacks at sea in particular that stopped his desperate bid for victory in the Battle of the Atlantic. The U.S. Strategic

Bombing Survey reached a similar conclusion: in wresting victory from the enemy submarine, "strategic bombing can at best be considered only an incidental contributing factor."<sup>34</sup>

By June 1943 the submarine menace had greatly subsided and the main effort of the Eighth Air Force thereafter was directed elsewhere. Only 16 per cent of its bomb tonnage was devoted to submarine targets during the latter half of 1943. The percentage dropped to 4 during the first quarter of 1944. It was not until late in that year that the intense activity noticeable in the German submarine building yards warned the Allies of the enemy plan to create a fleet of new-type submarines and caused the industry to be considered once more a principal target system.<sup>35</sup> But that is another story. For all intents and purposes the anti-submarine campaign carried out by the Eighth Air Force prior to 1944—an essentially defensive phase of its activity—was completed between October 1942 and June 1943. The CBO Plan, drawn up in April 1943 and approved in May, still placed submarines in first priority, but before it could be carried out to any important extent the submarine situation had for the time being greatly improved.

Compared to the antisubmarine campaign, the remaining efforts of the Eighth Air Force during the period under review appear tentative, scattered, and light. Although second only to submarines in order of urgency, aircraft installations sustained little more than 15 per cent of the total bomb tonnage dropped by the American bombers. Of the seven attacks made on targets of importance to the German Air Force, only four can be considered successful and only three—against the Erla aircraft and aero-engine works at Antwerp, the Focke-Wulf factory at Bremen, and the airframe factory of S.N.C.A. du Nord (formerly Avions Potez) at Meaulte—were of significant weight. All three of these heavier attacks, ranging from approximately 431,500 pounds to 526,000 pounds, resulted in concentrated and severe damage. Heaviest of all was the mission executed on 17 April against the Focke-Wulf Flugzeugbau at Bremen, at the time believed to have been devoting its entire facilities to constructing FW-190 fighters.<sup>36</sup> According to plant officials subsequently interviewed, this attack destroyed approximately half the factory and several completed aircraft.<sup>37</sup>

Axis rail transportation, given third priority at Casablanca, suffered almost as great a weight of bombs as did aircraft installations. Transport objectives in occupied France offered a constantly attractive alternative when weather prevented attacks on German targets and on the



Biscay submarine bases. These attacks may well have caused the enemy more trouble than those against aircraft objectives. Of the seven major attacks made by the Eighth Air Force, four—delivered against Hamm, Rennes, and Rouen—caused acute, if temporary, dislocation to marshalling yards and heavy damage to repair facilities.<sup>38</sup> Most spectacular were the results at Rennes when on 8 March sixty-seven bombers struck at the railway yard, cutting it at both ends and bringing all traffic to a standstill for three or four days. It was several days more, possibly two weeks, before normal traffic could be resumed. Meanwhile rail communications with Brest peninsula, and in particular with the submarine bases, were seriously disorganized, for Rennes constituted the strategic key to the whole railway network of Brittany.<sup>39</sup>

It was easy, however, to overestimate the traffic delay resulting from these missions. Repair gangs were large, efficient, and ubiquitous. Consequently, it appears that in no instance during the spring of 1943 was traffic held up longer than three to four days. The strain on German resources in skilled labor was, of course, considerable. Probably more important than track damage was the destruction of repair facilities, which undoubtedly contributed to a reduction in the number of operating locomotives and freight cars.<sup>40</sup> But, effective as they were in individual instances, the Eighth Air Force missions against rail centers were not carried out in sufficient strength nor frequently enough to produce more than a local and temporary dislocation. Although the RAF made several light raids specifically on rail objectives and a few heavy night attacks, especially during March, which involved rail installations, their effort failed to alter the situation materially.<sup>41</sup>

Practically all the bombing of rail objectives was done in March. After March the Eighth Air Force turned its marginal effort toward factories in France and Belgium producing motor transport vehicles for the German army. On two occasions (4 and 14 May) it damaged the plants at Antwerp formerly operated by Ford and General Motors. More important, however, was the bombing of the Renault motor vehicle and armament works at Billancourt, Paris, on 4 April. It was the first relatively heavy attack on this plant (85 bombers dropped 502,100 pounds of high explosives over the target area) since the RAF had bombed the same plant on the night of 3/4 March 1942. Almost every major building was damaged, in some instances the greater part of the shops being destroyed. According to contemporary estimates, considered conservative at the time, this attack cost the Wehrmacht at least

3,000 trucks; and it appeared unlikely that the factory could resume pre-raid production for more than seven months. British industrial analysts believed it to have been a more effective blow than that delivered the spring previous by the RAF, although the latter had done much to cast a creditable light on strategic bombardment in those days of doubt and experimentation.<sup>42</sup> In this instance, in contrast to the Vegesack raid of 18 March, contemporary intelligence reports proved reasonably accurate, even overly cautious. Subsequent investigation of German documents has disclosed that 81 of the 251 tons of high explosives dropped were effective against the target and denied to the enemy approximately 3,075 trucks, or 38 per effective ton and 35 per aircraft attacking. Corresponding figures for the earlier RAF attack showed 33 trucks denied the enemy per effective ton of bombs and 10 per aircraft.<sup>43</sup>

Although, as subsequent surveys discovered, 7.2 per cent of the plant floor space was structurally damaged, reduction of floor space was not a serious matter in this instance because of the availability of excess floor space. Of much greater importance was the problem of debris clearance, which required the equivalent of the total man-hours of the plant for 1¼ weeks. Reconstruction naturally constituted a major item, too. But the expenditure of labor in both types of work interfered very little with production because most of the reconstruction was done by outside contractors and because Renault man-hours spent were spread over a period of 4 to 5½ months so that no more than 1,000 Renault employees were used on this kind of work at one time. Destruction of machine tools did not interfere with production at all seriously except when it involved concentrations of specialized equipment, as, for example, where destruction of machines for making cylinders made it necessary for the plant to resort to general-purpose machinery which could perform only one part of a complex operation at a time, thus slowing production considerably.<sup>44</sup>

The American bombardment campaign in 1943 forced renewed consideration of the question of bombing civilians in occupied territory. In the spirit of the directive of 29 October 1942\* the Casablanca directive had recognized the serious political implications of the problem and had placed control over operations against strategic objectives in those areas in the hands of the British War Cabinet, which would presumably be in a position to react promptly and authoritatively to developments

\* See above, pp. 238-40.

on the political front. Generally speaking, the American bombers had been restricted in their activity over occupied territory to days when weather conditions made attacks against objectives in Germany unfeasible. Priority among the targets elsewhere was, of course, given to the submarine bases on the French coast, the strategic importance of which was believed to justify any measures necessary for their complete destruction.<sup>45</sup>

Strange as it may appear at first glance, it was not the bombing of the submarine bases, devastating as it was, that roused the severest criticism from the French population. The latter took a grim satisfaction in contemplating the discomfiture of the German operatives left in the bombed areas, most of whom belonged to the unpopular Todt organization. The people of Brittany knew only too well the strategic importance of the Brest peninsula, and despite their losses and their inevitably mixed feelings, many of them hoped an Allied invasion of the continent would come soon, and in Brittany.<sup>46</sup>

Elsewhere the bombings prompted an increasing undercurrent of protest among a population generally pro-British and pro-American. March had been an especially hard month, for it was then that the AAF made most of its attacks against rail objectives in occupied France; and since marshalling yards were normally embedded in populous areas it was inevitable that those areas would suffer seriously, even though accidentally. At Rennes, for example, the AAF mission of 8 March left nearly 300 civilian casualties. The French population not unnaturally felt that this was a terrible price to pay for "un si court délai et ralentissement du trafic."<sup>47</sup> Resentment tended to become concentrated against the Americans, whose high-altitude attacks seemed inevitably and appallingly inaccurate to those on the ground. The RAF, on the other hand, was regarded as "une arme de précision remarquable." This notion is not so paradoxical as, in view of the more familiar British doctrine of area bombardment, it might seem, because the RAF had for obvious reasons refrained from subjecting French cities to heavy night attacks, except in the cases of Lorient and St. Nazaire, from which the French population had been largely evacuated, and had made a number of accurate raids with four or five planes at low altitude against specific objectives.<sup>48</sup>

Criticism reached a climax in April. The Belgian ambassador to the United States protested the inaccurate bombing done by the USAAF at Antwerp on 5 April which had resulted in heavy civilian casualties.<sup>49</sup>

And among the French in London, criticism of American bombings in France tended to increase along with criticism of U.S. policy in North Africa.<sup>50</sup> Late in April the problem came before the British War Cabinet for general review. That body was unwilling to permit bombing of occupied countries except insofar as it could be accomplished without excessive danger to the civilian population, a policy which, although differing little from the position originally taken in October 1942, would, if strictly interpreted, have made it necessary to abandon all such bombing, since strays could hardly be helped even under the most favorable conditions. But strong arguments pointed toward continuing the bombardment of strategic objectives in occupied Europe. Not only were those objectives of sufficient importance to the Axis economy to warrant bombing but to attack them periodically would force the Germans permanently to disperse their defensive strength. The logic of military necessity in a total war proved unanswerable; and in June the CCS agreed that objectives in occupied countries, the inherent military importance of which justified such action, would under suitable conditions continue to be subjected to precision bombardment.<sup>51</sup>

### *The Tactical Experience*

To grasp the true significance of the early 1943 operations performed by the Eighth Air Force, it is necessary to look at them from the point of view of the tactician rather than the strategist. The day bombers were still learning their trade. During the months prior to February 1943 the Eighth had grappled with the basic problems of daylight strategic bombing for the first time under combat conditions and had elaborated certain basic tactical principles. Now, during the months from January to June, the main tactical problems were to extend operations, both in scope and weight, and to adjust basic practices to the shifting circumstances of the air war. Though not intentionally so, it was a period of final experimentation before the big offensive.

The Eighth continued to labor under certain handicaps. Its commanders would have preferred to increase the weight and range of its missions steadily and rapidly, but prior to May 1943 it received few reinforcements. Even replacement crews and aircraft arrived at a rate much slower than the losses incurred in operation or combat. In February the effective strength of the organization sank lower than it had been for many weeks. The service command was still devoting a sub-

stantial portion of its time to the preparation of units and replacements for TORCH; and during April and May its facilities were further strained by the arrival of new groups, the ground echelons of which had been left behind owing to the currently acute scarcity of shipping.<sup>52</sup> Nor were the new groups adequately trained. General Eaker was anxious to have units sent from the United States as soon as transportation became available, regardless of their training status; but the fact remained that he faced a serious and annoying problem in completing their training. Though better trained than the units that arrived in the ETO in 1942, those arriving during the spring of 1943 still fell far short of minimum requirements in all phases of gunnery and armament.<sup>53</sup>

Finally there was that perennial bogey, the weather. In January only four out of fourteen planned missions were carried out, the remainder having been canceled because of unsuitable weather. In February five were completed. With the advent of spring, the situation improved slightly, allowing nine missions to be completed in March, four in April, and nine again in May.<sup>54</sup> Experimentation in blind-bombing methods continued, but "moling" operations\* proved unsatisfactory and were abandoned after March. It was not until the end of September 1943 that Pathfinder missions† began to be flown.<sup>55</sup> Moreover, for want of a strong force of long-range escort fighters, the Eighth Air Force lacked the flexibility possessed by the RAF and was confined in its choice of target areas, a fact which only compounded the weather problem. There were always those among both British and American authorities (the Prime Minister, for example, and General Andrews) who insisted that the Eighth would have to resort to night bombing in order to increase the flexibility of its operations, for the atmosphere was generally clearer at night than by day. And, in fact, Eaker and his commanders continued to train and equip their units for night operations should such become clearly necessary.<sup>56</sup>

It would not have been surprising had morale declined in the face of these chronic handicaps. To a certain extent it did, of course. Commanders were impatient and often discouraged at the slow rate of Eighth Air Force operations and at the delay in build-up. Combat crews saw in the statistics of attrition and replacement the likely prospect of a short career. To make matters worse, commanders and crews alike were eager to strike at the German homeland, but hitherto they had been

\* See above, p. 262.

† See below, pp. 689-94, 706, 720.

prevented from doing so by tactical and strategic considerations the validity of which they did not always appreciate. In this restlessness they were joined by a considerable segment of British opinion.<sup>57</sup>

It came, therefore, as a tonic to all but the enemy when, late in January, the Eighth Air Force bombed Wilhelmshaven. Specific plans had been laid as early as November of 1942 to extend operations beyond the occupied areas, and the list of priority targets had been enlarged to include objectives in Germany proper. At Casablanca it had been decided to concentrate daylight bombardment as far as practicable on objectives in the Reich. Accordingly, on 27 January, ninety-one heavy bombers from both the 1st and 2d Bombardment Wings at last set out for Germany. Of this number, fifty-three succeeded in bombing the port of Wilhelmshaven.<sup>58</sup>

The uncertain weather prevailing that day over northern Germany may well account for the fact that the mission met much less opposition than had been anticipated. Flak was encountered almost continuously over Germany and the Frisian Islands, and several of the bombers suffered slight damage; but at no time was it intense enough or accurate enough to have deterred the attacking force in any way. At Wilhelmshaven, especially, the flak defenses appear to have been thoroughly confused, their effort at a predicted barrage being what a British observer who flew in one of the B-17's called "pathetic."<sup>59</sup> Considering the number of guns the enemy was known to have in the area, this poor showing came as a complete surprise to the American force. The only losses that occurred during the day's mission resulted from enemy air action. Both the B-17's of the 1st Bombardment Wing and the B-24's of the 2d Bombardment Wing brought up a sizable force of enemy fighters, estimated in all at more than 100 aircraft. In the resulting combats the Liberators lost two of their number and the Fortresses one. Yet even the German fighters proved less dangerous than had been feared, for they seemed much less experienced than those the bombers had encountered in France.\*

It was, if not an especially well-executed mission, a very interesting one. A relatively small force of heavy bombers, their crews no more experienced than they should have been, had penetrated by daylight, and necessarily without benefit of escort, well into the enemy homeland

\* AAF gunners shot down perhaps seven of the enemy fighters, and the mission may have been responsible for the loss of two other planes and for one damaged. (Information through courtesy of British Air Ministry.) Original claims were 22/14/13.



and had, moreover, done so without prohibitive loss. Operations of this sort had generally been considered feasible only for a large force of highly trained units. But, as Eighth Air Force commanders knew only too well, they might expect heavier and more efficient resistance in the future. And so it happened. During the mission of 4 February, when the Eighth attacked Emden, the bombers stirred up a hornet's nest of fighters. For the first time they were opposed by twin-engine fighters (Me-110's and Ju-88's) in addition to the usual Me-109's and FW-190's.<sup>60</sup>

On 26 February, one month after their initial plunge into German territory, the day bombers revisited Wilhelmshaven. They had intended to strike Bremen, but finding that objective completely obscured by clouds, they turned back to Wilhelmshaven where sixty-five of them bombed the harbor area to some effect. But it was a very different mission from that of the month previous. Flak was not much more dangerous than it had been on that occasion, although it may have accounted for one of the bombers lost. Enemy fighters, on the other hand, reacted in strength. Not only were the fighters of the affected area engaged but help was enlisted also from units as far south as Flushing. The concentration of purpose with which the attacks were launched was clearly evident from intercepted German radio messages.<sup>61</sup>

Two factors undoubtedly simplified the task of the enemy dispatchers. Almost from the point of rendezvous the bombers had been in the German RDF screen, with the result that the enemy was well prepared to intercept as soon as the bombers came within reasonable range. The danger of early interception was also aggravated by the fact that the planned route led around the coast line of northwestern Europe not far from the Frisian Islands, and the actual course clung apparently even closer to the coast. At any rate, in the ensuing battle the bomber force lost seven of its planes, possibly as many as six of which fell as a result of enemy air action.<sup>62</sup>

Despite the determination with which the German pilots pressed their attack, they were still reported as being more cautious than the more seasoned units in France. Nor did they attack so consistently from the front.<sup>63</sup> The Eighth Air Force had reacted promptly to a disturbing tendency of the enemy to concentrate on frontal attacks and, by fitting as many bombers as possible with additional nose guns and by stacking its formations with a view to providing mutual firepower forward, it had succeeded at least in reducing the menace. It is possible

that the less-experienced enemy units stationed in Germany at that time had been cautioned to respect this increased defensive power. The bomber crews had noticed a similar tendency on both previous missions to Germany.

During the mission of 26 February the Germans experimented with two new defensive techniques. The bomber crews reported encountering a box barrage of anti-aircraft fire over Wilhelmshaven which contained several black bursts, each of which released a parachute bearing an explosive charge. One group also reported an unsuccessful attempt on the part of an Me-109 to drop bombs on the B-17's from special external bomb racks. On 16 February during the raid to St. Nazaire a report of a similar nature had been rendered, but it was thought on investigation that the missiles in that instance consisted of self-destroying ammunition. The bomber crews again reported air-to-air bombing when on 22 March they returned to Wilhelmshaven. Again the tactic failed to cause damage.<sup>64</sup>

On 4 March an incident occurred which demonstrated, if demonstration were needed, that small formations could not hope to penetrate the fighter defenses in the Reich without crippling losses. The target for the day's mission was the marshalling yards at Hamm. It was the first time the Eighth had set out to bomb an objective in the Ruhr industrial area, and so the mission was planned with a view to reducing as far as possible the danger from enemy fighters that the necessarily long flight over enemy territory would entail. In order to confuse the enemy defenses the main force of seventy-one Fortresses headed out in a northeasterly direction over the North Sea roughly along the route taken on previous missions to Bremen or Wilhelmshaven. In addition, fourteen B-24's flew a diversion along a similar route but followed it for a much greater distance, keeping an eye out for incidental shipping targets. When about halfway between England and the Netherlands coast, the main force turned southeast toward Hamm. But from that point on, the weather upset these carefully laid plans, with the result that of the four groups of B-17's one returned to England without bombing and two others bombed the last-resort target at Rotterdam. The fourth group became separated from the main formation while flying on instruments, so that when it reached clear weather over Germany it found itself quite alone. It continued on to the primary target, however, and succeeded in bombing with unusual accuracy. So far it had met only light opposition, and it is probable that the carefully

planned route prevented the German fighters from becoming prepared far in advance. But on the route home they began to attack the fourteen Fortresses with the utmost determination, coming in, contrary to their recent custom in that area, mainly between 10 and 2 o'clock and sometimes making coordinated attacks by three planes all aimed at individual bombers. In all, some fifty enemy fighters, of both single- and twin-engine types, attacked the lone formation and shot down four of its planes. It was a costly operation, but considering the weight and determination of the attack, it is remarkable that more of the B-17's were not lost. Claims indicated that in the air battle the bombers may have destroyed upwards of thirteen of the enemy planes.<sup>65</sup>

The attack on objectives in the German homeland had been the engrossing fact to all concerned since the latter part of January. The missions had been relatively successful but, except for the first one, the cost had been high. On the first four the rate of loss, expressed as a percentage of the planes attacking, had been a little over 10 per cent. And most of the losses had resulted from air combat.<sup>66</sup> Yet the Eighth Air Force commanders were not unduly discouraged, for, they argued, a force of 300 or more planes (the number originally planned for such operations) would lose few if any more than did the small forces then being employed. Moreover, these missions had not been escorted, and a reduction in losses could be confidently expected as soon as long-range fighter support could be provided.<sup>67</sup>

Their optimism received considerable impetus when, after a two-week absence, the day bombers again flew to a German target and, on 18 March, bombed the submarine building yards at Vegesack. The route had been carefully planned in order to bring the bombers into contact with the enemy defenses at the latest possible moment; and, giving the Frisian Islands a wide berth, they succeeded in avoiding interception until they had reached Helgoland. Then the German fighters of all available types (FW-190's predominating) engaged the bomber formations in a running battle to the target area, and again on the return trip, some following the American force over water to distances of sixty to eighty miles beyond the coast line. Yet these attacks, persistent though they were, for the most part lacked the skill and daring of experienced units, suggesting that the four missions flown by the Eighth to French objectives during the preceding fortnight had drawn off the few well-trained units then stationed in northwest Germany. The gunnery of the bomber crews seemed, moreover, to have im-

proved.\* Best news of all to the tactical commanders was the relatively small loss (two planes) sustained by the bomber force. Considering that it provided also an example of very accurate and apparently effective bombing, it was a reassuring mission.<sup>68</sup>

Meanwhile the day bombers had been running into equally powerful defenses during missions to the submarine bases on the French coast. Indeed, crews reported defenses in the neighborhood of those objectives to have been more experienced in the ways of the American heavy bombers than those met in Germany. Flak at St. Nazaire, Lorient, and Brest had on more than one occasion caused the bombers serious trouble, and at St. Nazaire on 3 January it had been thrown up in a predicted barrage that destroyed several of the attacking planes. During January, February, and March flak at those points continued to cause much damage to the bombers and in a few instances destroyed them. For the most part the fire-control method used was a continuous following, and it was frequently so accurate that the bomber formations could hope to escape serious trouble only by taking violent evasive action.<sup>69</sup>

Yet it was the fighters here, as in Germany, that gave the Eighth its toughest battles. Since it was not possible for the bombers to have escort much beyond the French channel coast, they had to do their heaviest work (namely at Lorient and St. Nazaire) without fighter support over the target area. More important than the lack of full-scale escort was the experience and ingenuity of the enemy fighter units stationed in those parts. They pressed their attacks fearlessly and were constantly trying out new tactics. At Lorient, for example, on 23 January, they tried coordinated attacks in groups of six planes, the elements of which came in simultaneously from both sides and from above. Most frequently, however, the German pilots employed the nose attacks which worked so well against the inadequately protected bomber formations in December and January.<sup>70</sup>

To be sure, the bomber crews were also increasing in experience. By preserving as good a defensive formation as possible, by turning into the attacks, and by varying altitude as much as was consistent with tight formation flying, they managed often to evade otherwise lethal passes. In addition, the twin nose guns now installed in many of the bombers

\* Claims of 52/20/23 apparently reflected the confusion of a protracted air battle rather than an accurate count, for probably no more than fifty or sixty of the enemy intercepted.

were credited with breaking up many attacks. Yet even with these improved defensive tactics, the Eighth lost heavily in combat in the neighborhood of the U-boat bases. At Lorient on 23 January an attacking force of fifty-four bombers lost four to enemy aircraft and one to flak. Of the eight planes lost by the force of sixty-five that attacked St. Nazaire on 16 February, two definitely were shot down by enemy fighters, four were probably destroyed by fighters, and another two by a combination of fighters and flak. On only two occasions did the bombers have a relatively easy time in dealing with the German aircraft. On 27 February the RAF provided escort of such high quality that sixty bombers were able to complete their mission to Brest without loss of a single plane. And on 6 March the main force, sent to bomb Lorient, benefited materially when the bulk of the fighter defenses were diverted by a few B-24's dispatched to Brest for that purpose under heavy Spitfire cover.<sup>71</sup>

Fighter escort rendered missions flown during March to other targets in occupied France and the Low Countries a relatively simple matter. During March, six such missions were dispatched to points which, with the exception of Rennes, lay within escort range. On two occasions, at Rouen on 12 March and at Amiens and other points on the day following, forces of sixty-three and seventy-four bombers, respectively, completed their missions without loss.<sup>72</sup> By this time the prevailing doctrine of fighter support was based on the assumption that all rearward defense of the bomber formations would be the responsibility of the bombers and that the fighter support would so place itself as to defend the bomber formation from head-on attack, still the most dreaded enemy tactic. This method at the same time left the bombers a clear field, free from problems of identification, in which to engage all hostile aircraft approaching from astern. It represented also an effort to provide closer escort. The RAF fighters had been supporting the American bombers from the beginning in considerable strength (400 to 500 planes), but they had normally flown an "umbrella" type of cover, developed primarily to protect Wellington bombers which lacked overhead defense. This procedure made it possible on many occasions for the enemy to avoid the escort and, coming in beneath it, to engage the bombers with little interference. The Spitfires had, moreover, been warned not to come too near to the bombers, whose gunners tended to shoot first and identify afterwards. That problem remained, but the need for closer escort had come to be one of overriding importance.<sup>73</sup>

Despite fighter cover, the German defenders occasionally pressed their attacks with cleverness and determination, employing deceptive tactics and experimenting with a variety of approaches. A formation of sixteen B-24's ran into an especially well-planned and well-executed fighter attack during their attempt to bomb Rouen on 8 March. It was too small a force for ordinary purposes, but the heavy escort provided should normally have been enough to protect it. The enemy had apparently weighed that factor, for as the fighter escort approached the target to clear the way for the bombers, it was engaged by a considerable force of FW-190's. While the supporting fighters were thus occupied (and the German force was enough temporarily to saturate them), another swarm of German aircraft, which had evidently been waiting for just that opportunity, attacked the bomber formation with the utmost ferocity just as it was executing its bombing run. This defensive attack succeeded very well, for it destroyed two of the bombers, including the lead plane, and quite disrupted the bombing run.<sup>74</sup>

During April, the Eighth Air Force encountered increasingly fierce and versatile opposition from enemy fighters. The first three missions—to Paris on the 4th, to Antwerp on the 5th, and on the 16th to Lorient and Brest—had strong RAF withdrawal support but no escort over the target area, and it was mainly while the bombers were thus unprotected that the heaviest fighter attacks occurred. The fighters reacted in strength of fifty to seventy-five planes of all types and came in to the attack from all directions, with frontal attacks, though less exclusively employed than heretofore, still predominating. Their most effective tactic was the coordinated attack executed by waves of four to seven aircraft, approaching from the front at intervals of from 1,000 to 1,500 yards. Coordinated attacks had hitherto been the exception. Now they became frequent enough to be considered the result of a consistent plan. They had the effect of dividing the fire of the bombing formation; and they made it difficult for the pilots to take effective evasive action, for if the bombers turned into one attack they were left in no position to repeat the maneuver before the next batch of fighters was upon them. At Paris, too, the enemy concentrated on the poorly protected low squadron in one of the two combat wing formations and destroyed three of its six planes.<sup>75</sup>

The most effective defense the bombers could employ was to fly as close a formation as possible, with two to three combat boxes flying in combat wing formation so as to give each other the utmost support. Im-



proved forward firepower also helped a great deal. In the case of the Paris mission just mentioned, the low squadron would probably have lost even more heavily had not each aircraft been provided with twin nose guns in anticipation of just such an attack. Good results appear also to have stemmed from the careful planning of routes in these cross-Channel missions. The B-24's of the 2d Bombardment Wing flew effective diversions, and even the main attacking force executed feints on its way toward the enemy coast. These maneuvers no doubt account for the fact that fighter attacks became serious only after the target area had been reached. Defensive action on the part of the bombers seems, indeed, to have balanced the increasing ferocity of the enemy fighter opposition during these first three April missions, for total losses amounted to no more than 5 per cent of the attacking force, a rate of cost considered by no means prohibitive for daylight operations.<sup>76</sup>

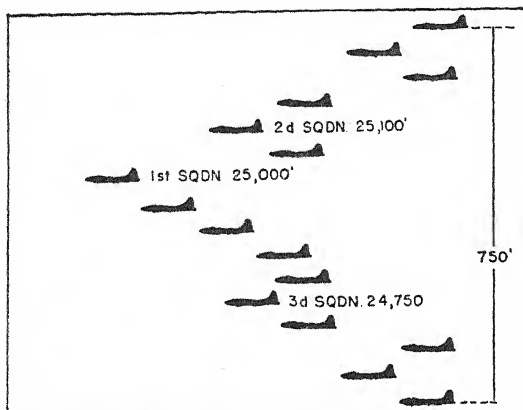
Things did not go so well when on 17 April the Eighth once more drove into the Reich in order to attack the Focke-Wulf plant at Bremen. It was the largest mission mounted to that date. One hundred and fifteen B-17's of the 1st Bombardment Wing were dispatched, 107 of which attacked. But this force also sustained a record loss: sixteen of its planes were shot down and forty-six damaged to some extent. Never before had the Eighth encountered such heavy or such well-coordinated defenses. While the Germans had undoubtedly recognized the tendency of the American bombers to attack targets in the Bremen-Wilhelmshaven area, the enthusiasm of the welcome on this occasion appears to have stemmed from advance warning provided in part by suspiciously favorable weather in the target area and probably in even larger part by a German observation plane which discovered and reported the bomber force while the latter was over the North Sea far beyond RDF range. It is known that this plane radioed the location, direction of flight, speed, and altitude of the bombers; and this information, coming more than an hour before the bombers, permitted the enemy to organize and concentrate his forces. This he did with skill and dispatch. A small detachment of fighters met the formation at a point beyond the Frisian Islands and accompanied it to the target, where a mass of German fighters, no doubt kept constantly informed of the bombers' course, were already assembled ready to attack at the critical moment of the bombing run. It seems to have been their main purpose to vitiate the effectiveness of the bombing by knocking down the leading planes and breaking up the bomber formations, because all attacks

were withheld until that moment. Over the target, also, the Germans threw up an unusually intense, though not always accurate, concentration of flak.<sup>77</sup>

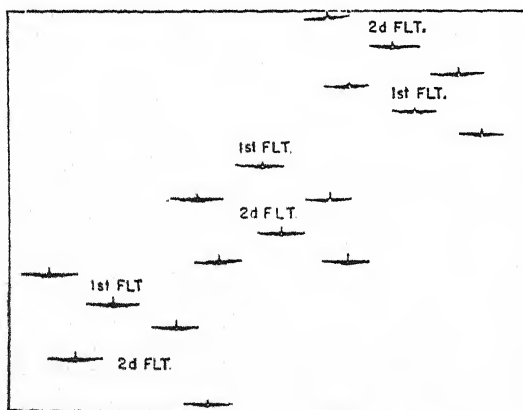
Reports suggested that perhaps as many as 150 aircraft intercepted. They made their first full-scale attack just as the leading bomber groups entered the flak concentration immediately over the target. Most of them drove in from the front, flying recklessly through their own anti-aircraft fire in a variety of coordinated attacks. Flak added to the confusion and accounted for one bomber. In addition, it probably caused some of the bombers to become stragglers and therefore an easy prey to attack by fighters later on in the battle. But it was of minor importance in comparison with the fighter opposition, and the quantity rather than the quality of the barrage was responsible for whatever success it may have had in confusing the bomber crews. Despite the severity of both fighter and flak attack, however, the first groups managed to maintain formation and to bomb with remarkable accuracy.<sup>78</sup>

On withdrawal from the target, the bomber formations sustained constant attacks, executed from all directions and maintained persistently well past the Frisian Islands. The enemy fighters concentrated on stragglers and on formations too loosely flown for effective mutual support. Especially significant was the experience of the two combat wings in which the bombers had flown, except on the bombing run itself. The concept of the combat wing formation, consisting of three combat boxes of eighteen to twenty-one planes each, had emerged during the preceding winter as a possible answer to the enemy's frontal attacks. Early experiments were marked by a tendency on the part of the individual elements to string out, thus destroying the compactness necessary for purposes of defense. During February and March much thought had been given to this problem, and by April the Eighth was able to fly a fifty-four plane combat wing in such a way that any fighter approaching from the front should encounter a solid wall of fire. In the Bremen mission it was believed that the more scattered formation maintained by the leading wing accounted in large part for the fact that it had suffered all the losses sustained that day. The elements of the second wing, flying in close support of one another, had gone free. It was true that the leading wing bore the brunt of the attack at the target and took some of its losses at that time. But the virtue of a tight defensive formation appeared nonetheless to have been clearly demonstrated.<sup>79</sup>

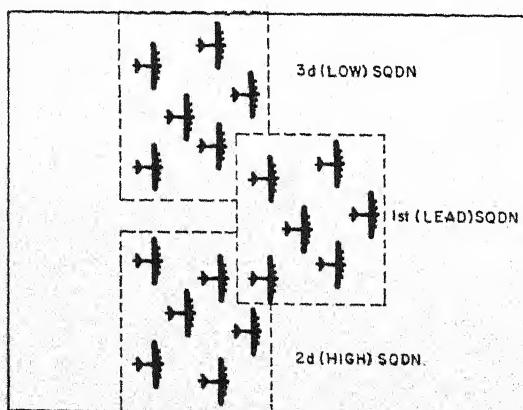
There remained, of course, serious objections to such relatively large



SIDE VIEW

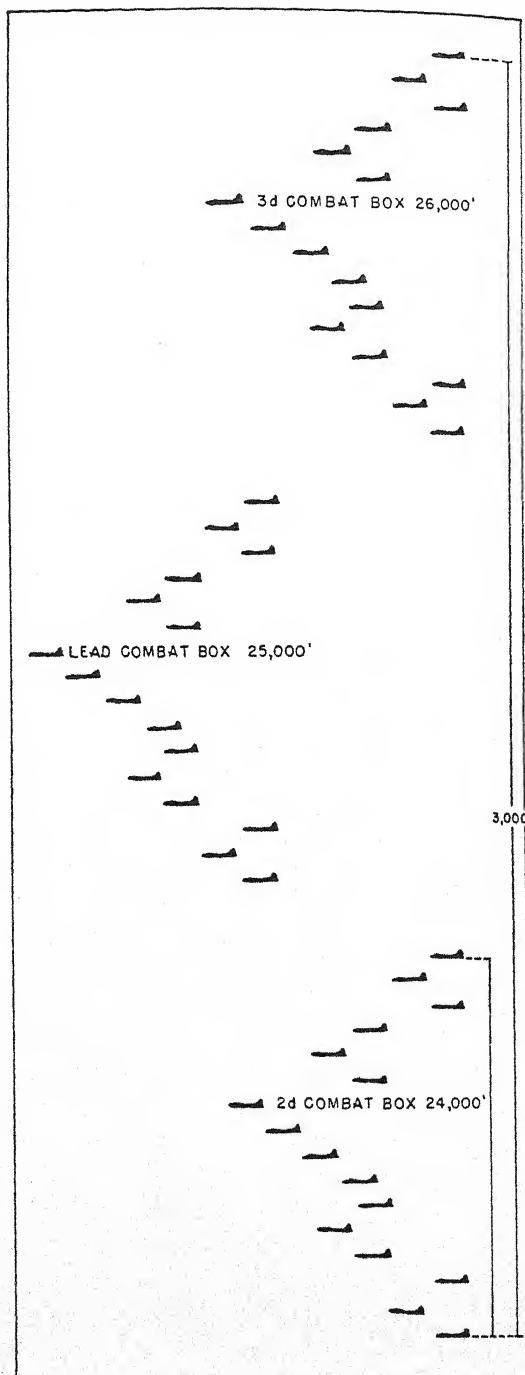


TAIL VIEW



PLAN VIEW

COMBAT BOX STAGGER



COMBAT WING - THREE COMBAT BOXES

and closely flown formations. The upper and lower squadrons obviously had the least protection, being in fact in a comparatively exposed position, and during late March and April the enemy fighters concentrated on them. Moreover, the formation was an unwieldy one, difficult to maintain—especially on turns—for it involved at best a wide variation in altitude. But for the time being the demands of defense had to be met before those of maneuverability.<sup>80</sup>

At the time, it had seemed to the crews returning from the Bremen mission that the Germans had suffered losses even heavier than those of the Americans. Claims were made for sixty-two destroyed, fifteen probably destroyed, and seventeen damaged. German figures, however, show total losses for the day, exclusive of those obviously not connected with the U.S. attack, of five fighters destroyed and five damaged as a result of "enemy action" and three fighters destroyed and four damaged for reasons not attributed to "enemy action."<sup>81</sup> Yet the mission had perhaps some effect on German tactics thereafter. Since February there had been a tendency for German planes to attack from some quarter other than the front. After April, nose attacks ceased to be the preferred method, except for the specific purpose of breaking up the bombing run.

By May the German fighter force was recognized as the primary obstacle to any extension of the daylight precision bombing campaign. In January, German fighter disposition on the western front was about what it had been in August 1942. It consisted of a shallow coastal defense from Brest to Helgoland Bight, weighted heavily in the Pas de Calais area. Indeed, owing to the urgent demands of the eastern and Mediterranean fronts, the total single-engine fighter strength on the western front, according to contemporary Allied estimates, dropped from about 270 in August 1942 to 215 in January 1943, a fact which led many U.S. air observers to underestimate for a time the capacity of the GAF.<sup>82</sup> But the slight tinge of optimism visible in January gradually faded out during the following months. By the middle of the year German fighter defenses on the western front had increased substantially and reflected the extended scope of Eighth Air Force operations into northwestern Germany. German figures indicate that there were on the western front and in Germany at the beginning of 1943 not many more than 350 fighters; by the middle of the year the total had risen almost to 600. During the first quarter of 1943, one-fourth of the total enemy fighter strength was located in Germany and the western front.

During the second quarter the proportion had risen to approximately one-third and was rapidly increasing—this at a time when the Germans, long believers in ground cooperation as the best use of air power, were suffering appalling defeats in the ground battles on the eastern front.<sup>83</sup>

More significant, however, than the increase in fighter strength was the rapid, if still somewhat chaotic, development in enemy tactics. The deadly nose attacks had been effectively thwarted (in fact, the enemy pilots were unwilling to close individually with the bombers unless absolutely necessary); but in their place there had emerged a Pandora's box of assorted ills, some of which were already proving embarrassing to the American force. Coordinated fighter attacks were a fruitful and infinitely versatile source of trouble. Twin-engine fighters were being used in the hope that their heavier firepower might be effective against the bombers. Parachute mines had been tried out, and air-to-air bombing had by May become an inveterate habit, characterizing almost every major engagement. And the Germans were rapidly increasing the effectiveness of their standard fighters by adding to their armament and armor. The Me-109 remained roughly equivalent in firepower to the P-47, but the FW-190 had been more heavily armed as a specialized weapon against intruding bombers. By mid-year of 1943 the American bomber force could measure the results of the increase in strength of the GAF in the west and of its mounting effectiveness. During 1942, 13.6 per cent of attacking bombers had been hit by German fighters; by the following June the proportion had risen to 18.2 per cent.<sup>84</sup>

The increasing effectiveness of the Luftwaffe's fighter defense pointed imperatively to the need for long-range escort. From as early as 1941, AAF leaders had recognized that need, but during the latter part of 1942—perhaps making a virtue of necessity—the Eighth Air Force had tended to minimize the value of fighter escort and to argue that heavy bombers, suitably armed and accompanied by a few escort bombers of the YB-40 type, could if necessary penetrate enemy defenses. Early RAF fighter cover, though heavy, had not been close enough to prevent German fighters from engaging the bombers if they chose. Moreover, prior to January, the bombers had come off well in combat with the enemy fighters.<sup>85</sup> But from that point on, the Germans began to improve their technique and the cost of unescorted missions began to increase. Conversely, fully escorted missions gave comparatively good results—in some cases outstanding results—owing in large part to an improving technique of close escort.<sup>86</sup> Long-range fighters

came, therefore, more than ever to be considered, if not essential to long-range daylight bombing, at least essential to its complete success.<sup>87</sup>

But the long-range fighters were slow in arriving, and even slower in achieving operational status. The TORCH project had drained the Eighth of all P-38 fighters. Their place was to be taken by P-47's equipped with long-range tanks. But unexpected design difficulties delayed delivery of the Thunderbolts, and although they began to arrive in the United Kingdom in January it was many weeks before "bugs" could be removed and the planes successfully adapted to operations in that theater. Trouble with the VHF radios was the principal cause of delay, although serious difficulty was also experienced with engines. For weeks radio experts worked on the offending equipment and at times enlisted aid from the British; but their effort was to little avail, as was demonstrated when on 10 March a few P-47's took part for the first time in a fighter sweep. Otherwise uneventful, that operation proved that plane-to-plane communication was virtually impossible among the P-47's. Since such liaison constituted the key to successful fighter tactics in the ETO, the new fighters could not be put into combat until the difficulty had been surmounted. On 8 April, however, two P-47 groups, the 56th and the 78th, joined the 4th Fighter Group (recently converted from Spitfires to P-47's) on operational status and were set to flying fighter sweeps over the Dutch and French coasts, largely for the purpose of training.<sup>88</sup>

A week later, during one of these operations, the P-47's had their first engagement with the enemy. Two composite groups, totaling sixty-three planes and led by experienced pilots of the 4th Fighter Group, flew a fighter sweep at 30,000 feet over the northern French coast and in the process encountered a number of FW-190's. On the whole the results were encouraging, for the Thunderbolts stood up very well in comparison with the German planes. The pilots reported superiority in diving ability and believed their P-47's showed great promise in turning as well. One pilot declared he was able to outrun the enemy at 17,000 feet. The P-47's shot down two FW-190's and damaged one, at a cost of one of their number. Two other P-47's were believed lost as a result of engine failure rather than enemy action.<sup>89</sup>

This first brush with the enemy seemed encouraging mainly because it came off better than many observers had feared. The P-47 had still not provided the solution to the problem of the long-range fighter. Engine failures continued to occur with discouraging, though decreas-



ing, frequency, and the radio experts were overcoming but slowly the difficulties that had earlier beset them. Much modification had yet to be done on both engines and radios before all available P-47's could be made operational. Worst of all, the new fighters as yet lacked auxiliary tanks, which meant that they could not go much farther than the Spitfires in accompanying the bomber formations. It was not until after May that these difficulties were overcome and the P-47 could be classified as a long-range fighter.<sup>90</sup> Meanwhile, with long-range fighters still in the future, hope continued to be pinned on the YB-40, that experimental, heavily armed escort bomber by means of which it was believed the tendency of the enemy to attack the lead groups and units in exposed positions in the bomber formations might be frustrated. Their arrival was eagerly awaited, but their entry into combat was delayed until May.<sup>91</sup>

Meanwhile also, the P-47's began to escort the bombers up to a range of about 175 miles. Their first effort was eminently satisfactory. Six squadrons of Thunderbolts joined six squadrons of RAF fighters in support of the mission executed by sixty-five B-17's against the Ford and General Motors factories at Antwerp on 4 May. The P-47's provided high cover and withdrawal support and shot down one FW-190. In the course of sixty-nine offensive sorties that day they lost one plane, and that one not apparently as a result of enemy action. The RAF Spitfires also destroyed one FW-190, probably destroyed another, and damaged three, at a cost of three of their own aircraft. A force of thirty-three bombers flew a diversionary feint over the Channel, under cover of three more P-47 squadrons. Thanks in part to this diversion and in part to the excellent fighter cover, the main force encountered only twenty to thirty enemy fighters, although total enemy reaction to the day's mission had been large. As a result, the bombing force was able to do its work accurately, with little disturbance from enemy action, and to return to base without losing a single plane.<sup>92</sup> The P-47's helped to ease the task of the bombers on other occasions during the rest of May. When, for example, on the 13th, the VIII Bomber Command attacked aircraft objectives at Meaulte and St. Omer, the VIII Fighter Command executed 124 offensive sorties in conjunction with cover provided by thirteen RAF squadrons. Total bomber losses were consequently held to less than 3 per cent of the attacking force.<sup>93</sup>

But missions beyond fighter range remained hazardous, and during the rest of May six were flown either to targets in Germany without

escort or to those in France with partial fighter cover. That partial cover was not much better than no cover at all was demonstrated on the 29th when a force of fifty-seven bombers attacked a railway target at Rennes and, although escorted by P-47's almost to the target, lost six of its planes to enemy aircraft between the time the escort turned back and the time when withdrawal support of RAF Spitfires was picked up at the coast on the return trip. The enemy had deliberately refrained from attacking until the bombers were left without fighter protection.<sup>94</sup> Losses had also reached the 10 per cent mark on 21 May when the bombers attacked Wilhelmshaven and Emden. As at Bremen in April, the enemy fighters concentrated their efforts on breaking up the bombing run. And at both targets they succeeded, so that bombing results were satisfactory at neither target. At the former a few of the enemy met the force of seventy-seven bombers as they approached the German coast, and as the bombers reached the initial point, preparatory to turning toward the target, from forty to sixty fighters appeared and queued up, twenty to thirty on each side of the leading bomber formation. As the invaders drew near to their target the defenders began to peel off and to execute frontal attacks in waves of four, six, and eight planes at a time, each wave flying in loose echelon formation. The fighters made seven or eight separate attacks during the bombing run with results disastrous to the Americans. Several Germans also tried air-to-air bombing, and some appear to have employed rocket guns and large-caliber cannon.<sup>95</sup>

The rest of these unescorted or partially escorted missions conducted during the latter half of May suffered much less severely from fighter attack. The reason is twofold. In the first place, improvement in defensive formation flying undoubtedly cut down losses considerably. (On the last mission in May, flown to St. Nazaire, the YB-40 put in its initial appearance, but, as it happened, fighter reaction to this mission was light and the flying dreadnoughts had little chance to demonstrate their ability.) In the second place, the Eighth Air Force was able during the latter part of May to send much larger forces against the enemy than hitherto. Not only were the forces bombing individual targets increased in size but simultaneous attacks on two or more objectives with effective forces were now possible. This latter tactic would, it was hoped, split the German defenses, thus rendering them less formidable at any given point.<sup>96</sup>

The expansion of the bomber force was the fact of primary signifi-

cance in Eighth Air Force operations in May. During the month five new B-17 groups—the 95th, 96th, 351st, 94th, and 379th—became operational, and the 92d, which had been used for training since November, resumed combat operations. The new groups, organized into the 4th Bombardment Wing under Brig. Gen. Frederick L. Anderson, took part in their first mission on 13 May. In addition to the heavy groups, May also witnessed the temporary addition of one medium group to the strength of the VIII Bomber Command. B-26 crews of the 322d Bombardment Group (M), representing the 3d Bombardment Wing under the command of Brig. Gen. Francis M. Brady, were ready on 13 May to fly their first combat mission.<sup>97</sup>

As General Eaker wrote in a letter to General Arnold on that date, the 13th of May was “a great day for the Eighth Air Force. Our combat crew availability went up in a straight line from 100 to 215.” And he was well pleased with the caliber of the new units, for the heavy groups had all received a quality of preparation for high-level bombing superior to that enjoyed by any of the earlier groups. “If the groups prove to be superior in combat to the old ones,” Eaker added, “it will scarcely be a fair fight!” In view of these reinforcements he was able to plan a change in bombing policy. Whereas in the past he had been forced to match rate of operations to the rate of replacements in order to prevent the Eighth Air Force from wasting away and had therefore waited for good bombing days when the primary target might with reasonable luck be identified and bombed, now he was able to plan operations for days of doubtful visibility when secondary or last-resort targets might be bombed and the GAF engaged in combat even if the targets of high priority were obscured. It was, moreover, a policy strongly urged by Air Chief Marshal Harris, whose night bombing force found opposition much less severe on nights following large-scale daylight raids.<sup>98</sup>

The Eighth Air Force was ordered to put its maximum force in the air on the 14th of May as part of a great combined attack against the German war machine. That attack, in fact, turned out to be the heaviest 24-hour air attack made yet by the Allies during the war. The RAF sent large forces against Berlin and against targets in the Ruhr and in Czechoslovakia, and the Eighth made an impressive display of its newly acquired strength in simultaneous attacks on four separate targets situated at Kiel, Antwerp, Courtrai, and Ijmuiden. In all it dispatched a record bomber force of 236 aircraft (including 12 medium bombers)

of which 209 (including 11 mediums) attacked—also a record to that date. In addition to the bombers, VIII Fighter Command P-47's flew 118 offensive sorties in conjunction with RAF Spitfire squadrons to protect the smaller forces bombing Antwerp and Courtrai. Results on the whole were good, each mission in its way meeting with a measure of success. The British press reacted enthusiastically, referring to the day's combined activities as the opening of a great "blitz" against Germany and featuring the unprecedented effort of the American force.<sup>99</sup>

In attacking Kiel, the main force of 126 heavy bombers (109 B-17's and 17 B-24's) struck the most distant target yet attempted, at a radius of some 460 miles. This fact may have thrown the German defenses off balance, for only a few of the antiaircraft guns known to be located in the vicinity of the objective were operating and the resulting flak was of little consequence. Nor were the fighter attacks, although numerous, pressed with the quality of determination observed on previous occasions in northwestern Germany. Claims against enemy aircraft were, however, very high (sixty-two destroyed, twenty-four probably destroyed, and twenty-seven damaged), indicating a heavy air battle even after allowance has been made for duplication in claims.\* It was the B-24 group, carrying incendiaries, that drew the heaviest enemy attacks, partly because it was in a relatively unprotected position (below the lowest group of the second combat wing formation) and partly because the performance characteristics of the B-24's prevented them from staying close enough to the Fortresses for protection. The group alone lost five of the eight aircraft shot down on that mission, a fact which led tactical observers to conclude that it was unwise to fly B-17 and B-24 units together in a single formation unless the latter were large enough to take care of themselves if separated.<sup>100</sup>

Although a minor part of the operations on the 14th, the attack executed by eleven B-26's of the 3d Bombardment Wing against the Velsen generating station at IJmuiden attracted much official attention because it constituted an experiment which might easily have decided

\* Once again the German records fail to support the American claims. But relatively high figures are indicated in German losses (exclusive of those obviously not the result of AAF action) of nineteen fighters destroyed and thirteen damaged in combat, with one other destroyed and two damaged for reasons not directly charged to "enemy action." It should be emphasized that these figures represent no more than the total losses which could be credited to the AAF gunners; some of the losses, as with two night fighters destroyed and another damaged in combat, may well belong in the RAF's column. They have been included here because the AAF mission was flown late enough in the day to have involved night fighter action. (Information through courtesy of the British Air Ministry.)

whether or not the medium bombers could be used effectively in the strategic bomber offensive. AAF Headquarters had been advocating for some time the fullest possible use of the mediums in minimum-altitude raids against suitable coastal objectives. In the Pacific they had been employed, often with brilliant effect, in deck-level attacks against naval targets, and it was believed that, if properly integrated with other air action, they might be equally effective against such installations as airfields and power plants in near-by coastal areas of Europe. Eighth Air Force headquarters, while not entertaining such high hopes, declared itself ready to investigate the possibilities inherent in these tactics. It was accordingly planned to send the mediums out against coastal installations in operations closely coordinated with heavy bombardment missions. Targets were chosen for initial operations which would necessitate only shallow penetration of enemy territory. The Eighth Air Force suggested enemy airfields situated near the coast as objectives of first priority, but the RAF urged that the American medium bombers be directed against the same type of installations the British light bombing units were attacking, namely, transportation objectives and power stations. Plans were also laid to integrate medium bomber operations with those of the heavies. With coastal targets in mind, combat crews were especially trained in the techniques of minimum-altitude navigation and attack. Those immediately responsible for launching the mediums advocated the extensive use of fighter cover, for it was likely that, after their initial attack, the B-26's would be met by dangerous fighter opposition. But their requests were unfavorably considered on the ground that zero-altitude fighter support would be impracticable and that if escort were required the bombing would have to be done at altitudes of 10,000 to 14,000 feet, depending on the anti-aircraft defenses provided for each target.<sup>101</sup>

The experiment of 14 May led only to tentative conclusions, however. The B-26's performed their task with indifferent results, but without the loss of a single plane. They encountered no fighter opposition—a fact which was not surprising since the largest force of heavies in the history of the daylight offensive was abroad that day. And had the navigation been more exact, they might have escaped the minor flak damage sustained by most of their number.<sup>102</sup> Much more conclusive indications were obtained three days later when eleven B-26's were sent in two flights to attack respectively the same target at IJmuiden and the power station at Haarlem. Again the mediums flew at zero

altitude and without fighter support. One plane turned back on account of mechanical difficulty. The rest were lost, including all personnel except two enlisted crewmen who were rescued at sea some four days later. Little is known about the fate of these planes except that they ran into fighter opposition in addition to a heavy concentration of flak. Nevertheless, the mission served to clarify the place of medium bombardment in the strategic bombing campaign. It was considered evident that worth-while coastal targets were too heavily defended to be profitably attacked at low altitudes, and it began to look as if the mediums could contribute only incidentally to the success of the strategic bombing campaign. General Eaker consequently decided to place them in VIII Air Support Command and to train them primarily as part of a tactical air force for the purpose of supporting the ground forces in the forthcoming invasion of the continent. Meanwhile, crews could continue to gain experience in medium-altitude attacks (10,000 to 15,000 feet) against strategic objectives under heavy fighter cover.<sup>103</sup>

Viewed as a whole, the success with which the Eighth Air Force solved the problem of penetrating rapidly stiffening enemy defenses may be estimated in terms of the losses and battle damage incurred. For the five months from January to May, inclusive, the bomber loss rate, expressed as a percentage of credit sorties (i.e., sorties in the course of which the aircraft has entered areas normally defended by the enemy or has in any way been subject to attack) was 5.6 per cent. This figure includes both those bombers lost in action and those listed as falling in Category E, that is, damaged beyond economical repair while engaged in an operational mission. Expressed as a percentage of aircraft actually attacking the target, the figure rises to approximately 6.4 per cent. Fighter losses ran much lower, amounting only to about .7 per cent of credit sorties, but then many of the missions on which the new P-47 groups were sent had been planned in such a way as not to expose the inexperienced units needlessly to enemy action. Of the bombers missing in action (not including Category E) over half were known to have been lost to enemy aircraft, and several of those listed as lost to unknown causes doubtless met a similar fate. Flak, on the other hand, could be credited wholly or in part with the destruction of slightly over 14 per cent.<sup>104</sup>

Regarding battle damage the story is somewhat different. A trifle over 29 per cent of all credit sorties resulted in reparable damage, not more than one in five of which cases could be considered damaged to



any major extent. Of these damaged aircraft, approximately 59 per cent were hit by flak; and flak damage no doubt made it possible on many other occasions for enemy fighters to destroy the bomber entirely.<sup>105</sup> Thus flak, while of relatively small importance as an immediate cause of bomber losses, was a major source of damage, and since a damaged plane easily became a straggler, flak often proved an important indirect cause of losses. Enemy fighters remained nonetheless the principal obstacle in the path of the daylight bombers.

If the Eighth Air Force tactical experts had to grapple with the problem of penetrating enemy defenses as a matter of most immediate urgency, they by no means forgot that the primary purpose of bombardment is to strike the enemy—and of precision bombardment, to do so with the utmost accuracy. The basic bombing techniques had been elaborated during the first five or six months of operations, and their close relationship with the requirements of defense had been initially explored. During the first half of 1943 it was therefore mainly a question of increasing the skill of the combat units, of developing established techniques, and of adapting them to the needs of a larger operating force.

For reasons of defense it had become standard operating procedure for the bombing force to bomb in some sort of formation, and by February a considerable weight of opinion favored bombing by combat box or group, each aircraft dropping its bombs on a signal from the lead bombardier. But during the period in question a variety of sighting methods continued to prevail. Group formations frequently dropped on the leader, who sighted for both range and deflection, but often individual bombardiers within the formation performed independent range sighting, and often also individual squadrons dropped on the sighting of their own lead bombardier. In March the Operational Research Section of the Eighth, after a careful study of results, recommended strongly that, when bombing in formation, bombs should be dropped on the leader rather than according to individual sighting for range. It also suggested that the effectiveness of bombing on the leader would be enhanced if the length of the resulting bomb pattern could be reduced, either by flying closer formations, or by dropping more promptly on signal, or both. Thereafter, bombing on the leader became the normal technique, although some units continued to favor other methods. Of course, particular problems called for different solutions. When attacking small targets, for example, the units often bombed in

flights of six or even fewer because a group bomb pattern would necessarily be too large to be at once effective and economical.<sup>106</sup>

In March, also, the Eighth began successfully to employ the automatic flight-control equipment (AFCE) as an aid to accurate bombing. The purpose of this automatic pilot, which could be controlled by the bombardier on the bomb run, was to synchronize sighting and pilotage with mechanical precision and to provide a steadier bombing run than could be achieved even by veteran pilots. The few seconds immediately before the bombardier released his bombs obviously constituted the critical moment in the entire mission, for it was then that the bombardier performed his final sighting operation. So it was essential that the aircraft should be held as nearly as possible to a steady course without slips, skids, or changes in altitude, and that the pilotage be as free as possible from the influence of flak and of attacking fighters. Perfection of this sort was impossible even with the best of pilots. With those produced by the hasty training program into which the AAF had been forced it could not even be approximated.<sup>107</sup>

Promising as it was in theory, the AFCE had proved disappointing in its earlier trials. By March, however, certain modifications had materially increased its usefulness and on at least two missions during that month it was used by a group bombardier with very good results. At Vegesack on 18 March the most surprising results were achieved. On that mission the 305th Group, dropping on the signal of its lead bombardier who had used the automatic pilot, succeeded in placing an estimated 76 per cent of its bombs within a radius of 1,000 feet of the aiming point. The results of the Vegesack action, while not attributable entirely to the use of the new equipment, did much to overcome a prejudice against AFCE still prevailing in many quarters. Although it continued to fail occasionally, and although unforeseen circumstances sometimes prevented its employment on the bombing run, the automatic pilot continued to give good results; and as it became available it was installed in the lead planes of most bombing formations.<sup>108</sup>

Partly because of improved techniques and partly on account of the increasing experience of the few groups operating from the United Kingdom since November 1942, bombing accuracy in the Eighth Air Force improved appreciably from January to May of 1943. The records are of uneven value, but it is possible to see that, whereas in January and February a group could consider its bombing above average if 20 per cent of the bombs identifiable by photo reconnaissance fell

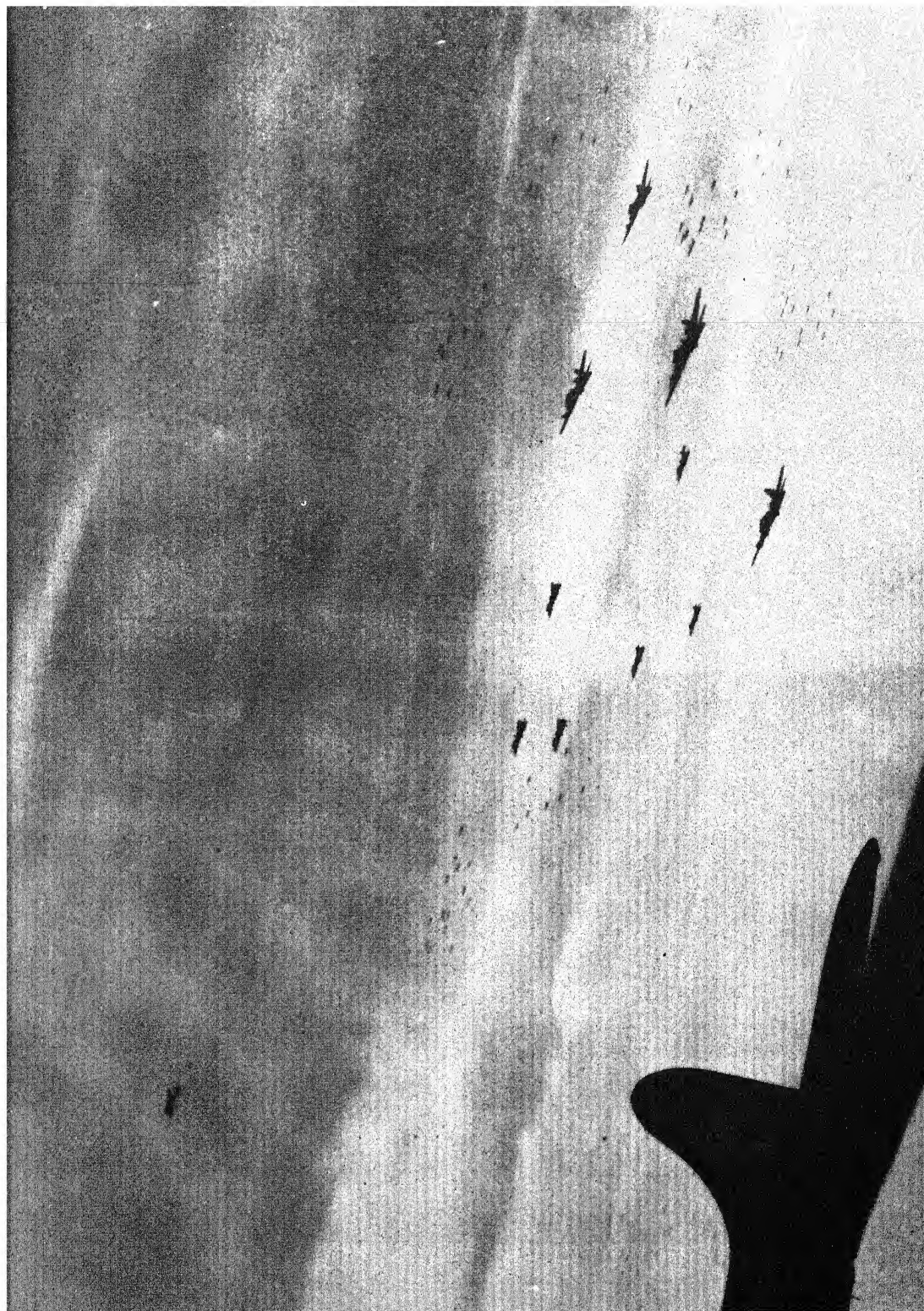
## THE ARMY AIR FORCES IN WORLD WAR II

within 1,000 feet of the preassigned aiming point, in March and April it was not uncommon for groups to record 30 to 40 per cent in that category, and several instances were reported above the 50 per cent mark. Improvement is also noticeable in the concentration of the bomb patterns. Some of the better results were obtained under trying conditions, even in the face of stiff enemy resistance as for instance at Bremen on 17 April when, in spite of very heavy flak over the target, fierce enemy fighter attacks, hazy weather, and clever camouflage, very satisfactory bombing was accomplished—one group placed 60 per cent of its bombs within the 1,000-foot radius. Over-all results of outstanding accuracy were obtained at Rennes and Vegesack in March, at Paris in April, and at Meaulte in May.<sup>109</sup>

A number of bombings, of course, continued to result in complete failure. More than once in three times a bombing unit would place the center of its bomb pattern over 3,000 feet from the aiming point. Many of these so-called gross errors were not entirely the fault of the bombardiers. In several instances poor visibility made accurate bombing impossible. In others, fighter opposition was so effective that it broke up the bombing run, as at Rouen on 8 March when the lead bombardier was shot down just as he was approaching the target and the rest of the unit recovered from the confusion of the moment only to scatter their bombs as far as ten to fifteen miles from the target. Sometimes, too, the bombsight in the lead plane would not function properly, thus causing the entire group, if the other planes were dropping on the leader, to bomb inaccurately.<sup>110</sup>

But on many other occasions the trouble lay with the negligence or inexperience of the crews themselves. Confusion at the bombing run, failure to follow instructions or to test instruments, overconfidence, or simply lack of adequate training occasionally led groups astray. Inexperience became especially noticeable when in May the 4th Bombardment Wing began operations. Later on, as the 3d Bombardment Division, these groups were to do distinguished service, but in May their work was erratic in the extreme. On the 19th for instance, they performed one of the most accurate missions made in the ETO to that date. Then two days later, everything went wrong, and in the confusion the target escaped completely unscathed.<sup>111</sup>

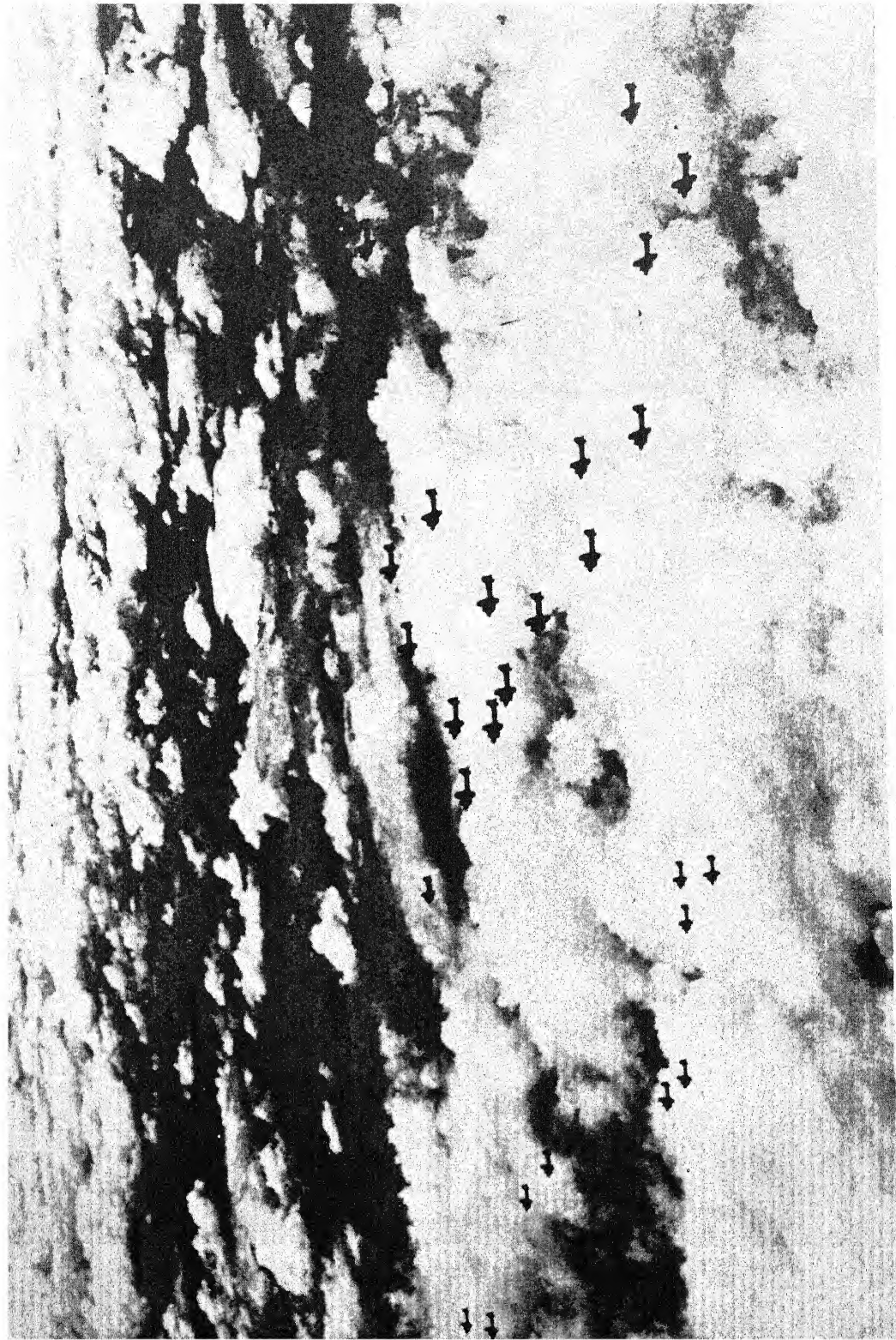
Indeed, the latter part of May witnessed the beginnings of a temporary decline in bombing efficiency. But the inexperience of new units was only one of the factors involved. More important was the fact that





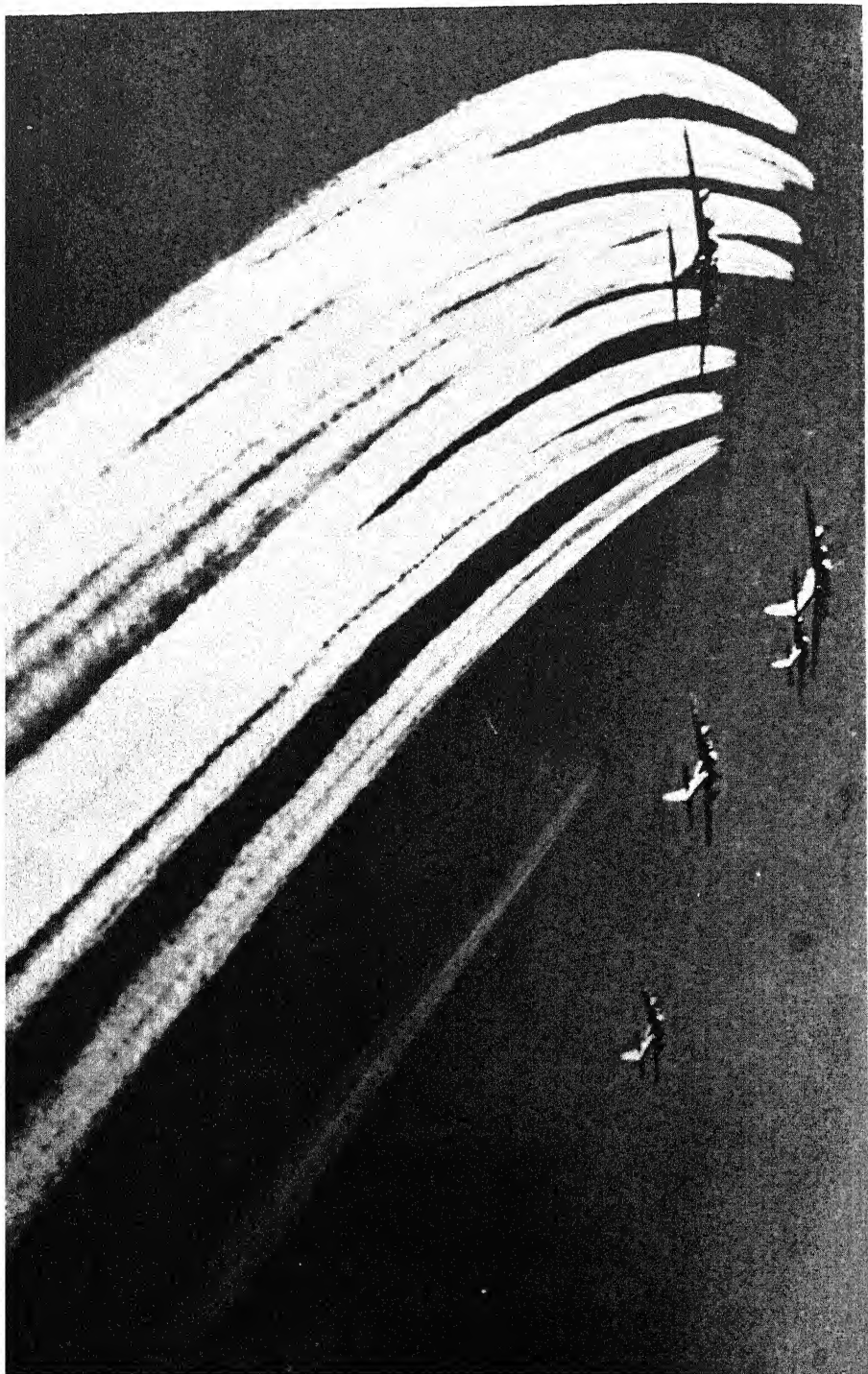


COMBAT FORMATION



B-17 COMBAT FORMATION





B-17 CONTRAILS

a larger operating force raised new problems. For a curious thing about formation bombing, noticed in May by Eighth Air Force tactical analysts, was that the leading group or groups tended to achieve better results than those following them over the target. The trouble was later found to decrease appreciably as experience was gained in the handling of large bombing forces. But the tendency remained. It is difficult entirely to account for it except on the ground that succeeding formations, insofar as they are unavoidably influenced by those preceding them, are subject not only to the adverse conditions ordinarily expected on a bombing mission but to conditions created by the mistakes of the leading groups as well. At any rate, regardless of the state of training of the units involved in a mission, the incidence of gross errors was likely to increase in direct proportion to the size of the operating force; and the problem of securing maximum accuracy in the over-all attacking force became an entirely separate one from that in the individual bombing unit. That being the case the ideal solution would have been never to allow more than two groups to bomb a single target in a single action. But dictates of defense made larger forces imperative, and so the solution had to be sought during the succeeding months principally in experience cumulatively acquired in large-scale operations.<sup>112</sup>

Another problem was raised in May by the employment of incendiary bombs on a relatively large scale by large bombing formations. Incendiaries had been employed sporadically in the fall of 1942 but had not been used since then. Now, in May, it was coming to be recognized that incendiaries might, by destroying the temper of steel plates and machinery, cause more industrial damage in certain circumstances than high-explosive bombs. On three occasions, at Kiel on the 14th, at Emden on the 15th, and at Kiel again on the 19th, part of the bomber force carried incendiaries. This practice caused certain difficulties. Since the ballistics of incendiaries is quite different from that of high-explosive bombs, requiring a closer approach to the target before release, a longer bombing run was required by units carrying them, which meant that the leader of the wing formation had to take into account the extra distance to be flown by the unit carrying incendiaries and had to plan his withdrawal accordingly. That unit had also to be placed in the last position in the formation in order to prevent other groups from flying through the cluster adapters from the falling incendiaries. There were two difficulties with these tactics: the incendiary group was likely to

be in the least well-protected position in the formation; and the longer bombing run necessary when incendiaries formed part of the bomb load left the formation open to enemy attack for an additional unprotected period. Here again the problem of bombardment tended to merge with that of defense.<sup>113</sup>

At the end of May, the Eighth Air Force could look back over the record of the past five months with a certain degree of pride. The case for daylight bombing had not been conclusively demonstrated but the operational experience had on the whole substantiated the theories argued by Eaker at Casablanca in January. The fact that U.S. bombers could operate over Germany had won over many British airmen<sup>114</sup> and occasionally—as at Vegesack—bombing results had seemed brilliant enough to impress the Air Ministry and Churchill.<sup>115</sup> The latter's hearty congratulations must have been especially welcome because of his vigorous opposition to the daylight bomber campaign at Casablanca, but for that matter any public British praise was appreciated.

For despite the official sanction granted the daylight bombing experiment in January, skepticism concerning its chance of success died hard. An intermittent barrage of criticism, not always too well informed, had continued on both sides of the Atlantic. AAF leaders found especially galling, and of real disservice to their planning, a book written by Mr. Allan A. Michie of the *Reader's Digest* staff and published early in 1943.<sup>116</sup> In his book, *The Air Offensive against Germany*, Michie accused the AAF of holding up the aerial destruction of Germany's war potential by a stubborn and doctrinaire rejection of RAF methods in favor of daylight operations which were tactically unsound and currently impracticable. These charges provoked a flurry of concerned comment in the American press and were not overlooked by the House appropriations committee.<sup>117</sup> Highly sensitive to unfounded criticisms which might prejudice its position in top-level deliberations on strategy and logistics, the AAF thus welcomed the continued support given to the Eighth's program by British authorities,<sup>118</sup> and such public statements of RAF-Eighth Air Force accord as that made in an address at New York on 28 April by Air Vice Marshal W. F. MacN. Foster.<sup>119</sup> And the same sensitivity goes far to explain the AAF's desire that the operations of Eaker's force be accorded a full and favorable press coverage.<sup>120</sup>

Whatever the flavor of public opinion, when early June brought a matured plan for the CBO, the Eighth was ready to take a fuller share

in the campaign. That the Germans had come to have a growing concern for daylight strikes at their war potential could be sensed from the increasing size and ferocity of their fighter reaction. Similarly the Americans had enlarged both the scale and the scope of their operations though hardly as rapidly as they had hoped. During May, VIII Bomber Command had flown 1,340 bomber sorties as against 298 in February, and had lengthened its radius of action to a maximum of 460 miles from the East Anglian bases. But readiness for a new phase in the bomber campaign could not be expressed wholly in sorties or miles. More significant, if less easily measured, was the experience gained in bombing, in penetrating enemy defenses, and in handling the larger forces now available. And the Eighth had learned that, to profit from such experience, tactical doctrine must be kept flexible and sensitive to the slightest change in a fluid tactical situation still dominated by a powerful and resourceful enemy. These lessons, rather than intrinsic damage wrought in Germany, give meaning to the operations of early 1943.

Two basic and complementary propositions had emerged from the months of battle: one, that the GAF constituted the gravest threat to the daylight strategic bombardment offensive; and, two, that this offensive had as yet encountered no insuperable obstacle. From these propositions it could be reasonably argued that daylight bombing was tactically feasible but that the GAF must be destroyed before the bomber offensive could accomplish its strategic purpose. Such arguments did much to shape the CBO plan in its subsequent form.

## CHAPTER 11

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### *THE CBO PLAN*

THE Casablanca conference had given to the concept of a combined bomber offensive against Germany an unchallengeable place in Allied plans, but it left much to be done before the concept could become a reality. The American day bomber force had to be built up to the point where it could carry its share of the air war effectively and economically. A comprehensive plan of attack had to be worked out according to which the combined force might operate systematically and in the reasonable hope that within a given length of time the planned invasion of western Europe might be successfully launched. Since the RAF Bomber Command was already fully deployed in the strategic offensive against Germany and since most of the outstanding problems consequently centered upon the build-up of the U.S. bomber force and the nature of its part in the combined operation, the burden of planning fell mainly on the USAAF. On 18 May 1943 the CCS approved the "Plan for the Combined Bomber Offensive from the United Kingdom," which in turn served as the basis for a directive of 10 June 1943 officially inaugurating the CBO proper.

#### *Target Selection*

Target selection was of the essence in laying detailed plans for the CBO. As Giulio Douhet, early prophet of air power, had foreseen, it was here that the air commanders would show their ability: "the selection of objectives, the grouping of zones and determining the order in which they are to be destroyed is the most difficult and delicate task in aerial warfare, constituting what may be defined as aerial strategy."<sup>1</sup> What may not have been quite so clear to Douhet was the paramount value of systematic industrial analysis as a basis for the selection of targets for strategic bombardment. Inasmuch as the aim of strategic bombardment was to reduce the enemy's ability to wage war, it became

essential to analyze the economic sources of his war potential. And inasmuch as the USAAF was, by way of its doctrine of precision bombing, committed primarily to the destruction of industrial targets, it approached the problem of industrial analysis with peculiar gravity.

Indeed, during the months following Casablanca the USAAF took the initiative in planning for the strategic bombing of Germany, and the moving spirit in that effort was a concern for the scientific selection of targets. The CBO Plan was drawn up substantially on the basis of a report submitted to General Arnold on 8 March 1943 by a committee of analysts which had been working toward that end in AAF Headquarters since December of 1942. This report attempted to set forth the industrial objectives in Germany the destruction of which would weaken the enemy most decisively in the shortest possible time. If the results of the bomber offensive did not in every instance confirm the recommendations contained in the report, the attempt to apply a scientific method to the problem of target selection is nonetheless of considerable historical interest.

The Committee of Operations Analysts (COA), as the group came somewhat inaccurately to be called, brought to their task a clearly articulated methodology prompted by the feeling that a more selective system in the analysis of objectives was needed. The committee's action was founded solidly upon faith in the scientific method and on the specific belief that that method could be applied successfully to aerial warfare. And its views were colored throughout by the preconceptions inherent in the American doctrine of precision bombing: industrial analysis should make it possible to destroy the keystone in the arch of German production without expending effort needlessly or indiscriminately on objectives of less than vital importance.

The first and most obvious step in the analysis of enemy industry was to bring the enemy economy into its proper focus for strategic bombing operations, to anatomize it, and to define the relationship of each part to the enemy war effort.<sup>2</sup> Next it was necessary to eliminate as many industries as possible from selection as suitable targets, being careful the while that as good reasons were found for eliminating an industry as for including one. Then the individual industries were taken apart plant by plant, with a view to the feasibility of destruction in each instance. After the above steps had been completed, each industry could be listed in order of priority for bombing, and each target within each industry.



In the course of this investigation answers had to be obtained to the following questions: (1) What are the minimum requirements of the enemy? In other words, at what point would a shortage impair the front-line military effort of the enemy? (2) What are the production capabilities of the enemy? If every facility in every European country, including occupied U.S.S.R., were utilized to the utmost, what would be the total? (3) How nearly self-sufficient is the enemy? That is, what relationship exists between capacity and minimum requirements, taking into consideration stockpiles and available substitutes? (4) Where are the enemy plants located and what percentage of total capacity is represented by each plant? (5) What are the physical characteristics of the installations themselves? To what extent are the buildings and machinery structurally resistant to high-explosive and incendiary attack? To what extent are they replaceable? (6) What is the time lag between the destruction of each plant and the effect on front-line strength? (7) What is the force required to effect the necessary destruction? What, in short, will be the cost?

Two of the above questions, that concerning the minimum requirements of the enemy in relation to his productive capacity and that regarding the time lag between plant destruction and effect on front-line strength, were of particular importance. It was not enough, for example, to establish the fact that Germany was producing a certain quantity of steel and that it would be feasible to destroy a certain percentage of its steel-producing plants. The critical problem was rather to determine whether and to what extent it would be possible for the Germans to make use of alternate capacity in the form of stand-by plants, to restrict nonessential consumption, and to draw upon stores of already processed material. Knowledge of the time factor was equally vital. If the full effect of a bombing program would not be felt for twelve months, it would be folly to attempt at the end of no more than six months a ground invasion which depended on the prior success of the air attack. Moreover, if the effects of a bombing program were too long delayed, there was every chance that the enemy could adjust his economy in such a way as to reduce or even erase the effect of the bombing on his front-line strength. So it was useless to attack an industry lying too deep in the economic process; and it was equally futile to strike indecisively, with a force and at a rate unequal to the task.

These, in brief, were the principles of target selection with which the COA undertook the task of analyzing German economy. The prin-

ciples were not the product of the moment, however. In fact they were fairly well developed when, in December 1942, that committee began to function. Back of its work lies a long history of target selection. Owing in part to their close proximity to the German-dominated continent of Europe and to their extreme vulnerability in event of war, the British had, since 1929, been at work analyzing the industries of potential enemies with a view to possible strategic bombardment. Their approach was substantially the same as that of the COA with one exception, namely, their emphasis on the bombing of areas rather than of individual installations. Just as the American analysts had their method shaped by their operational doctrine, so the British were influenced by theirs. British analysts were not, however, unaware of the virtues of attacks on key or "bottle-neck" industries. A paper prepared by the Air Ministry in July 1939 called attention to the value of these restricted objectives.<sup>3</sup> There were, it said, "vital spots in industry as well as in the human body," but it warned that these would probably be well guarded by natural circumstances or by artifice. In addition "there are . . . many alternative manufacturing processes, and the manufacture of an essential commodity is frequently already undertaken or can readily be started in many different factories, particularly in countries which have made a deep study of their industrial economy and have organized their industry to meet modern war conditions." Area attack, on the other hand, "is not intended to imply an indiscriminate scattering of projectiles over the whole or any part [of a specific industrial area]. . . . On the contrary, there will be definite objectives in the area itself normally consisting of industrial targets [which] . . . constitute the chief vital spots of the industrial body."

Despite a continued willingness to consider the destruction of specific industries vital to German front-line strength, the British, in emphasizing area attack, laid a basis for target selection which could not easily accommodate a force devoted to the attack of precision objectives. Just as the RAF plan of attack differed from that of the American, the industrial intelligence compiled by British analysts was likely to differ qualitatively from that demanded by the USAAF. During the period when the AAF was planning its day bombing campaign against Germany and during the earlier months of that campaign, the American force depended for its target planning largely on British intelligence sources. But it was inevitable that sooner or later it would have to make its own analysis of German industry.

Several American agencies had been performing studies of industrial objectives in western Axis territory: Military Intelligence Division of the War Department General Staff, research and analysis section of the Office of Strategic Services, and enemy branch of the Board of Economic Warfare. Target information for the use of the Eighth Air Force had been compiled largely by its own plans section, but the target information section of AC/AS, A-2, was by summer of 1942 being called upon increasingly for advice regarding the projected bombing program. It found itself with a great mass of factual data concerning German industry but without any rational system of selection. It therefore set out to compile for specific industrial systems a series of studies which would get to the heart of the problem of target selection.<sup>4</sup> Roughly speaking, these air estimates, as they were called, began by establishing the importance of the industry in question to the enemy war machine as a whole. Then followed detailed statements of the enemy's minimum requirements in that field and of the available supply. The industry was then analyzed with regard to its vulnerability to air attack, and an estimate was made of the time necessary before destruction from bombing would become effective in reducing fighting strength.<sup>5</sup>

One of the most difficult points to establish was the relationship between minimum requirements and supply. There was a tendency on the part of many industrialists who, in order to obtain a basis for comparison, were consulted on certain phases of the U.S. economy, to think in terms of supply alone and to assume that supply was generally determined by requirements and would therefore reflect requirements with some degree of accuracy. U.S. railway experts, for instance, when asked how much reduction in railway facilities the country could stand and still keep its armies effectively deployed, replied that U.S. railway capacity was already strained and that any reduction would have a serious effect. But apparent requirements and minimum requirements were often two different things; and on further study it was estimated that a reduction of almost one-third of U.S. railway capacity could be absorbed without impairing the war effort at all. Analysis of German rail transportation convinced the air analysts that no effect on German fighting ability could be expected until 31 per cent of rail facilities had been destroyed. Similarly, it was estimated that other German industries, no matter how vital to the war effort, were less tight than had generally been thought.<sup>6</sup>

The air estimates, by December 1942, had become the subject of considerable discussion. To some observers they seemed to smack of defeatism; to others they indicated a need for still more concentrated effort along the same lines. In either case they contributed to a mounting concern in the Air Staff regarding the problem of target selection in Europe. Also contributing was the controversy over AWPD-42. That document, essentially a statement of U.S. air requirements, had, it will be recalled, been built around the concept of a systematic bombardment of German war industry. It had come nearer than any document hitherto produced in AAF Headquarters to being a comprehensive bombardment plan; and insofar as it attempted to name each feasible target in the major industrial systems and to estimate according to a rational, if somewhat theoretical, method the size of force required to destroy the objectives, it represented a step forward in the direction of systematic target selection. But it had been completed in September, before the other efforts of A-2 had gone far enough to provide the systematic body of industrial intelligence considered necessary for that sort of study, and it suffered from the inchoate state of target information prevailing at that time. AWPD-42 was under discussion at the highest level during most of the fall of 1942, and as the discussions progressed, its limitations in the field of target analysis became the more readily apparent. Especially severe were the criticisms leveled against it by the Joint Intelligence Committee.<sup>7</sup>

On 9 December 1942, General Arnold signed a directive requiring Col. Byron E. Gates, AC/AS, Management Control,

to have the group of operational analysts under your jurisdiction prepare and submit to me a report analyzing the rate of progressive deterioration that should be anticipated in the German war effort as a result of the increasing air operations we are prepared to employ against its sustaining sources. This study should result in as accurate an estimate as can be arrived at as to the date when this deterioration will have progressed to a point to permit a successful invasion of Western Europe.<sup>8</sup>

At the time, no such group existed except in skeleton organization, but Colonel Gates was authorized to create one and to deputize civilian as well as service personnel for the purpose.<sup>9</sup> This inclusion of civilian "experts" was in accord with a growing feeling in AAF Headquarters that staff officers did not have the time to devote to economic analysis and that such activity was of a type for which their regular army training did not provide the best preparation.<sup>10</sup>

Meanwhile, the problem of target selection had been brought to the

attention of certain eminent civilians. Elihu Root, Jr., of the New York financial firm of Root, Clark, Buckner, and Ballantine, and Edward M. Earle, of the Institute for Advanced Study at Princeton, both showed an interest in the project and indicated their willingness to serve on the committee authorized by General Arnold. Dr. Earle was experienced as a historian of diplomatic and military affairs. Root had had unusually wide experience in the field of finance and in the general administration of industry. In a similar position was Thomas W. Lamont of J. P. Morgan and Company, who joined the committee on 7 January 1943.<sup>11</sup> In addition to these men who served in an independent capacity, Fowler Hamilton was called in to represent the Board of Economic Warfare and Edward S. Mason to represent the Office of Strategic Services. The rest of the group consisted of Col. Edgar P. Sorensen, AC/AS, A-2; Lt. Col. Malcolm W. Moss, chief of target information section, A-2; Lt. Col. Thomas G. Lanphier, representing G-2; and Col. Guido R. Perera and Lt. Col. W. Barton Leach, both from Management Control. Colonel Gates acted as chairman. Strangely enough, the group did not include anyone whose special competence lay in the fields of industrial engineering and management. Originally called the Advisory Committee on Bombardment, it was this group which came to be known as the Committee of Operations Analysts.<sup>12</sup>

Administratively speaking, the creation of the COA was an important step because for the first time in the United States it made the assimilation of industrial intelligence from all sources and the analysis of that information for the purposes of air target selection clearly the responsibility of a single agency. It also did a useful service by removing the task of target selection from ordinary military channels and placing it where it could be performed free from the restrictions inherent in relatively obscure staff work.

Subcommittees were delegated to study each pertinent German industrial system. Much of the initial work consisted of bringing up to date, checking, and supplementing wherever possible the work already done in A-2 and in the various government agencies.<sup>13</sup> The sources of information tapped by the COA subcommittees were many and varied and included records provided by the War Department, OSS, BEW, WPB, ONI, OSRD, the Bureau of Foreign and Domestic Commerce, the Department of Justice, and the State and Treasury departments. The British Ministry of Economic Warfare (MEW), the Air Ministry, and the RAF continued to provide valuable data.<sup>14</sup> Late in January

1943 four members of the COA flew to England where they compared notes with the British agencies and also with A-5 of the Eighth Air Force and the Economic Warfare Division of the American Embassy, both of which had been working on target information in the theater.<sup>15</sup> Assuming (not too soundly as events proved) that the industrial system in one highly industrialized country would be essentially similar to that of any other highly industrialized country, the COA paid close attention to the organization and physical characteristics of appropriate U.S. industries. Much of their information came from qualified experts in private industry.<sup>16</sup> By March 1943 special studies had been completed, or were nearing completion, on nineteen German war industries.

On the 8th of that month the COA reported its findings to General Arnold. The directive of 9 December 1942 under which the committee had operated had specified that it determine as nearly as possible the date upon which the sustaining sources of western Axis military strength might be so reduced through aerial bombardment as to permit an invasion of the continent. This the committee declared itself unable to do for two reasons: first, it could not forecast with any degree of certainty the air forces which would be available and, second, the operational experience of the Eighth Air Force to date formed an inadequate basis for conclusions as to accuracy, attrition, and certain other operational factors affecting such a proposition. It did, however, present certain important conclusions. Concerning target selection it declared:

It is better to cause a high degree of destruction in a few really essential industries or services than to cause a small degree of destruction in many industries. Results are cumulative and the plan once adopted should be adhered to with relentless determination.<sup>17</sup>

Concerning the projected bomber offensive, it made two pronouncements:

- (1) The destruction and continued neutralization of some sixty targets would gravely impair and might paralyze the Western Axis war effort. There are several combinations of targets from among the industries studied which might achieve this result.
- (2) In view of the ability of adequate and properly utilized air power to impair the industrial sources of the enemy's military strength, only the most vital considerations should be permitted to delay or divert the application of an adequate air striking force to this task.

The report stressed the need for continuing effort in the analysis of target information and for continuing close cooperation between Brit-



ish and American agencies in that regard. It further recommended that, since operational factors such as weather and the disposition of the enemy, known only to commanders in the theater, played often a decisive part in choosing particular targets and since the Eighth Air Force was aware of and in agreement with the principles of target selection set forth by the COA, the current selection of specific objectives be left to the responsible authorities in England, subject only to such directions as might be called for by broad strategic considerations.

For reasons of security the committee refrained from stating a formal order of priority for the target systems considered. But it is clear from the arguments presented that the systems were listed in descending order of preference, and there is reason to believe that the committee did so as a result of a policy informally agreed upon.<sup>18</sup>

First on the list came the German aircraft industry. It was fully appreciated that an early attack on that system would be essential to the success of later bombardment operations. The force of this argument had been generally admitted ever since the GAF had begun to react effectively to the daylight operations of the Eighth. It was estimated with some degree of accuracy<sup>19</sup> that, although fighter production had been given preference by the Germans, wastage and production in that industry were delicately balanced. But a diversity of opinion existed, both in the United States and in England, as to whether the attack should be directed primarily against fighter assembly plants or against fighter engine plants. The proponents of the attack on the former argued that, since the current ratio of German single-engine fighter strength to monthly production was 3 to 1, the German fighter force was having to re-create itself from fighter assembly lines every three months. Destruction of seven assembly plants, even if the enemy could repair the damage at the end of one month, would have to be repeated but twice to reduce substantially German strength in single-engine fighters. If five separate component erecting shops were included in this attack, production could be curtailed for approximately six months owing to the destruction of intricate jigs and other hard-to-replace machinery.

Proponents of attack on fighter engine plants pointed, however, to the recuperability of final assembly plants unless extensive damage were done to both assembly sheds and component erecting shops. On the other hand, engine assembly plants were believed to require six months or more for full recuperation; and an attack on them would strike at

replacements needed for operational aircraft. But it was conceded that, on the basis of American experience, the time lag between the completion of an engine and final assembly of a finished aircraft varied from one month to six weeks, during which time something over 500 enemy fighters could be produced. This question of time, in addition to the fact that engine plants constituted somewhat less vulnerable targets than final assembly plants, appears to have been given great if not decisive weight. For, although the COA recommended bombing all of twenty-two targets consisting of final assembly plants, component erecting plants, and engine assembly plants as part of a single target system, the first two categories were clearly given precedence over the last. All but one of these twenty-two targets lay within 400 to 600 miles from London, and together they were estimated to account for more than 90 per cent of single-engine production.

"It is difficult to determine whether an attack on aircraft engines would have been preferable to that delivered against airframes," the report of the U.S. Strategic Bombing Survey declared in 1945. Considerable German opinion, however, held that it would have, and recent investigation of the German aircraft industry indicates that, although the capacity of the industry as a whole during the first years of the war was more than adequate, less excess capacity existed in engines than in airframes.<sup>20</sup>

Next to fighter aircraft, and closely related to their manufacture, came ball bearings. On the basis of American experience as well as according to British opinion, it was argued that ball bearings represented a potential bottleneck in German industry, especially in the manufacture of war materiel. It was the belief of both British and American economic authorities that stocking of ball bearings was not practicable and had not in fact taken place. It was believed that only the larger plants were capable of making a full line of ball bearings and that smaller plants concentrated on specialized types. Furthermore, the Schweinfurt plants alone were correctly reputed to manufacture in the neighborhood of one-half of the total Axis production, thus offering a peculiarly concentrated target within practicable flying range. While the effect on enemy front-line strength would not be immediate, the indirect effect would, it was felt, be great and pervasive, touching eventually all high-speed equipment. This effect could not be timed accurately, but it was believed that it would begin to be felt within one month. Subsequent intelligence indicates that the committee somewhat

overestimated the vulnerability of ball-bearing plants and underestimated the feasibility of effecting economies in the use of bearings, possibly also of stocking them.<sup>21</sup>

Petroleum was given third place. Germany's oil position was rightly considered to be extremely tight, though not quite so tight as it later turned out to have been.<sup>22</sup> It was pointed out that crude oil represented two-thirds of available Axis oil supplies, of which crude supplies 60 per cent was produced in the Ploesti area of Rumania and the rest widely dispersed in small amounts in other Axis countries. The remaining third of the Axis oil came from synthetic products, of which 80 per cent was believed to emanate from thirteen Bergius hydrogenation plants and the rest from numerous Fischer-Tropsch plants. The committee estimated that destruction of the thirteen hydrogenation plants would deprive Germany of about one-fourth of her available petroleum sources, including two-thirds of her existing production of aviation gasoline. Resort to stocks, substitutes, and working inventories could probably not delay the full effect of the destruction of these plants for more than four months. Although strongly constructed, they were believed vulnerable to air attack and difficult to reconstruct. If, in addition to the hydrogenation plants, some twenty-six refineries were also destroyed, supplies of petroleum products would be cut 90 per cent, with obviously disastrous consequences to the German war effort.

Oil was thus considered an important target. But it was not given the high place that the wisdom derived from later events indicates that it should have had. The COA apparently felt that Germany controlled enough stand-by refining capacity to cushion the immediate shock of bombing and to delay the effect on front-line strength beyond the point where the aerial effort would be immediately profitable.<sup>23</sup> The committee was apparently handicapped here, more than in most instances, by lack of adequate intelligence data. It underestimated the importance of synthetic production; and it gave little attention to the close technical integration of both hydrogenation and Fischer-Tropsch synthetic oil plants with the chemical industry, especially that part of it producing explosives and synthetic rubber.<sup>24</sup>

The COA report gave fourth place to grinding wheels and crude abrasives. In doing so it reflected, as in the analysis of the nonfriction-bearing industry, the committee's preoccupation with bottlenecks in enemy industry. The report demonstrated the essential part played by grinding wheels in the manufacture of innumerable metallic parts for

war equipment. It pointed out that wheels were rapidly consumed, there was no substitute for them, they were difficult to stock, and they were produced in vulnerable installations. Crude abrasives could be attacked in order to heighten the effect of attack on the grinding-wheel industry, but the relative invulnerability and recuperability of that industry made it a less attractive target than the grinding-wheel factories.

Next came nonferrous metals: copper, aluminum, and zinc. Although neither aluminum nor low-grade zinc production was considered a high-priority target, it was believed that something could be said for attacking copper mines and smelters and alumina-producing plants in view of their importance in war production. It was admitted that the use of these metals lay too deep in the economic process to warrant priority attention. Nonetheless, the industry was believed, probably somewhat optimistically, to be very tight and the destruction of key factories feasible.<sup>25</sup>

It is very possible, as the U.S. Strategic Bombing Survey later concluded, that the synthetic rubber industry might profitably have been given attention earlier in the war. That the COA gave it only sixth place is in fact a by-product of its failure to appreciate fully the close interdependence of synthetic rubber and synthetic oil plants. Had it been recognized, for example, that the former depended largely on the latter for hydrogen, both might have been elevated jointly to a higher priority.<sup>26</sup> The committee also overestimated the probable amount of blockade-running the Germans would be able to conduct in order to import rubber supplies. Imports during the war appear to have been negligible, and Germany was consequently thrown back almost completely on three large synthetic plants and one small one for her requirements.<sup>27</sup> The value of this target system, as contemplated by the COA, while high in terms of concentration and vulnerability and in view of the inadequacy of mobile stocks, was reduced by blockade-running, which was estimated to contribute, together with the reclamation of scrap, approximately one-third of Germany's rubber supplies. It was believed that destruction of ten tire plants, which were susceptible to incendiary attack, would more immediately damage the enemy position than the destruction of the two major synthetic plants.

When it came to submarines, which it placed seventh, the COA expressed profound misgivings concerning the results to be expected from bombardment either of operating bases or construction yards. Con-

struction yards had for some time been considered both by American and British authorities to be targets of doubtful value.<sup>28</sup> Admitting that complete and simultaneous destruction of all nineteen yards in Germany and three less important ones in Italy would probably delay by at least thirteen months the launching of any new U-boats, the committee argued that the quick recuperative capacity and large facilities available would minimize the effects of anything other than a devastation attack on the industry as a whole, and that even such complete destruction would not reduce the operating U-boat fleet for approximately one year. The five operating bases along the French coast offered not much more encouragement. They had been attacked at an increasing rate since October 1942 in the hope that repair and refitting work might be slowed up and the number of operating U-boats consequently be reduced. But evidence on this point, though admitted to be by no means complete, was considered to be of an essentially inconclusive nature. It appears, therefore, that the committee was well on the way toward the healthy skepticism regarding the bombing of submarine installations which by the end of the year had become very marked and which has since been amply confirmed by German records.<sup>29</sup>

In eighth and ninth place came respectively military motor transport vehicles and the transportation system in general. On the face of it, motor transport vehicles seemed to offer a fairly profitable target, for supply was estimated to fall considerably short of military requirements and 85 to 90 per cent of the truck production was believed concentrated in seven plants. It now appears that, if a concentrated attack had been planned on oil and rubber, motor transport vehicles might well have been ignored as a separate objective.<sup>30</sup> As for rail and water transport, the committee labored under no illusions whatsoever. Without for a moment minimizing the vital importance of transport facilities to the entire enemy war economy, it maintained that limited and scattered attacks upon transportation targets would be of little consequence because the recuperative powers and flexibility of that system permitted rapid and successful readjustment. There were, it stated, no key or isolated transportation targets the destruction of which would be decisive. An attack would have to be widespread and sustained; and at that time the committee was unwilling to think in terms of mass attack or of attack on any but the most concentrated industries. Although the bombing of transportation has since been recognized as of decisive

importance in the defeat of the Axis,<sup>31</sup> it is very probable that its effectiveness could not have been realized until a sufficient force had been built up to make the necessarily heavy and ubiquitous attack feasible, and until it was possible to take immediate advantage of a generally disorganized transport system by decisive ground action.

Owing to the large number of coke batteries in Axis Europe, coking plants were not considered a suitable target system, despite their vulnerability and the undoubtedly basic importance of coke production in a number of critical industries. Iron and steel, in the eleventh position, received still less favorable consideration. Wisely enough, in the light of later investigation,<sup>32</sup> the COA assumed that the western Axis position with respect to steel was generally strong and that the destruction of even one-half of the steel-producing plants would have little effect on the military effort over a period of one year. Such plants were, moreover, relatively invulnerable to attack on account of the ruggedness of their construction and equipment. Even the production of high-grade alloy steels, which was at once more critical and more vulnerable than that of ordinary steel, was believed to involve enough potential alternate facilities to insure a substantial time lag between destruction and effect on front-line strength.

Machine tools were considered generally to lie too deep in the industrial process to constitute high-priority targets as long as the industries they supported were in operation. Tools required for new or changed types of final product might, however, become critical items. The destruction of twelve selected plants, it was stated, would reduce machine-tool replacement capacity by 40 per cent, with effects that would eventually be felt throughout Axis war industry. Although the machine-tool industry was only placed twelfth on the list, the fact that it was given consideration at all betrays a faulty understanding of that industry as carried on in Germany. At this point the assumption of essential similarity between industrial processes in Germany and the United States proved misleading. German manufacturers had a conception of the use of machine tools entirely different from that of their counterparts in America, where rapid turnover of plant inventory and a tendency toward early obsolescence in machine-tool types generally discouraged the accumulation of large replacement stocks. In Germany, where machine tools were treated as long-term investments, the industry had managed to build up a comfortable reserve, leaving excess producing capacity in the form of plants at one time devoted to manu-



facturing for export. What might have been the case had machine tools been attacked systematically is hard to say, but the fact remains that at no time did German industry as a whole come anywhere near being short of machine tools.<sup>33</sup>

A curious omission in the list of high-priority targets was the electric power system. It was recognized, of course, that German industry was largely dependent on electrical energy for continued operations. But it was believed that in almost no instance was any single industry dependent on one electric generating plant. Rather each industry depended upon a network which pooled the greater part of the electrical energy within an area. It was considered that by destroying thirty-two targets in the Rhine-Ruhr area, for example, heavy industry in that area could be in large part eliminated. But an attack on the power industry as a whole was felt to be of questionable validity. Equally questionable was the vulnerability of electrical power plants to aerial bombing, judging from British experience during the "blitz."

It is easy for the observer after the fact, equipped with wisdom that the knowledge of subsequent events alone can confer, to criticize conclusions arrived at without any such assistance. But the failure of the Allies to attack German electric power and the failure of the COA to recommend it both stem from a lack not of prescience but of adequate information regarding the situation as it currently prevailed—a distinction of the utmost importance in a historical study of this sort. It now appears that the Germans themselves were constantly concerned about the limitations of their so-called grid system, the difficulty of adding capacity, the relationship of curtailment and shortage of electric energy to production losses in industry as a whole, and, above all, the danger that the Allied command would discover the extreme vulnerability of their electric power industry. The U.S. Strategic Bombing Survey summed up the situation by saying that, in the state of critical shortage in which industry found itself, any loss of production in electric power would have directly affected essential war production, a fact which the Germans themselves readily admitted.<sup>34</sup>

Electrical equipment, optical precision instruments, food production, and antiaircraft and antitank machinery were treated by the COA, for good and sufficient reasons, as of little significance in the bombing program. But the chemical industry, and in particular the nitrogen industry, received equally scant recommendation. Separate studies had been prepared on several aspects of that complex, namely on coke, syn-

thetic oil, synthetic rubber, and nitrogen. Analyses of the production of explosives and other chemical products were not separately undertaken, either because of the known availability of substitute products, the number and dispersion of plants, the existence of large amounts of excess capacity, or the fact that the product had only an indirect relationship toward military activity. The COA's views on coke, rubber, and oil have already been canvassed. Admittedly nitrogen was important to Axis military effort in the fields of explosives, synthetic oil, and fertilizer. But only 8 per cent of nitrogen production was believed used in the manufacture of explosives. And, although it was estimated that 42 per cent was devoted to synthetic oil production and that if twenty-one principal nitrogen plants were destroyed the effect would be felt in the oil industry within three months, no attempt appears to have been made to correlate the two for the purposes of strategic destruction.

The COA was in this instance again handicapped by a faulty understanding of the German chemical industry. Synthetic rubber, synthetic oil, nitrogen, methanol, and other important chemicals formed interdependent parts of a single industrial complex. The production of nitrogen and methanol, both of extreme significance in the manufacture of explosives, was heavily concentrated in synthetic oil plants. The attack on synthetic oil, when it finally came, in fact succeeded in producing, as a fortuitous by-product, a marked drop in the production of nitrogen, which in turn contributed to the shortage of explosives experienced by the Wehrmacht in the closing campaigns of the war. The nitrogen industry, according to the Strategic Bombing Survey, possessed "all the qualifications to have been a primary bombing target." Not only was nitrogen essential but there were no possible substitutes for it, and most of its production was "unusually concentrated" in a few plants. Moreover, an attack on it would also have been an attack on the synthetic oil industry. It therefore appears that, had the interdependence of the synthetic oil, the synthetic rubber, and the principal chemical industries been fully appreciated, they might all have been subject to early and concentrated attack with much profit to the Allied cause.<sup>85</sup>

On 23 March 1943 the COA report, after being favorably considered by General Arnold's advisory council, was sent to the United Kingdom for coordination with the British authorities and the Eighth Air Force. The report was reviewed by a committee created for the purpose, composed of representatives of the Air Ministry, the Ministry of

Economic Warfare, the RAF, and the Eighth Air Force. The general reaction of this group is indicated in the following statement: "The Report of the Committee of Operations Analysts is eminently sound. It is a magnificent piece of work. A careful review of it indicates that its conclusions coincide with the facts available to us, and with all information available to the RAF and the Air Ministry, which was freely placed at our disposal." To this opinion Sir Charles Portal added his personal indorsement.<sup>36</sup>

To be sure, there were some points upon which British authorities disagreed. The MEW declared itself in "substantial or close agreement" with the COA's conclusion on aircraft, ball bearings, petroleum, nonferrous metals, synthetic rubber and tires, transportation, and submarines. On the others the MEW spokesman, C. G. Vickers, expressed some reservations. Several, he said, "appear to have been based on what we regard as a somewhat superficial examination of the enemy's position and show a certain divergence of opinion between us on questions of fact, which we are already in process of trying to reconcile by discussion here and in Washington." But, he added, these divergencies mattered little because they related to industries which neither agency considered as likely candidates for adoption as primary targets. On three points only was there significant disagreement. The MEW took a less optimistic view than the COA of the damage an attack on grinding-wheel factories could inflict on Axis industry and based its argument mainly on the large number of plants and the probable existence of considerable stocks. In the second place it advocated closer study of the possibilities of attacking major transport and aircraft facilities by way of selected internal-combustion engine components and accessories. Finally, the MEW believed the possibilities of affecting aircraft production through attack on propeller factories worthy of further investigation. It is interesting to note in passing that on the subject of nitrogen the MEW was even less enthusiastic than the COA, claiming that some 20 per cent of enemy producing capacity was at the time lying idle.<sup>37</sup>

On the basis of the COA report—and on the advice of the MEW, the British Air Staff, and the Eighth Air Force—a final list of primary objectives was drawn up consisting of seventy-six targets in six systems arranged as follows in order of priority:<sup>38</sup>

Submarine construction yards and bases  
German aircraft industry

Ball bearings  
Oil  
Synthetic rubber and tires  
Military transport vehicles

It will be noticed that grinding wheels and abrasives and the nonferrous metal industry, given respectively fourth and fifth place in the COA report, were deleted from the final list of primary objectives, no doubt on the advice of the British. On what specific grounds submarines retained the priority given them at Casablanca is not apparent from the documents at hand; but it is safe to assume that the problem of shipping in the Atlantic convoy lanes, which had reached a climax in April, had forced the issue. Otherwise there appears to have been general unanimity of opinion. Concerning German fighter aircraft, especially, the British Air Staff agreed heartily, urging, indeed, not only an attack on the single-engine fighter industry but on all fighters. In a paper dated 9 April it argued that all British and American bombardment forces should, in the first stages of the proposed offensive at least, be concentrated against the GAF, especially the fighter force, to the exclusion of all other objectives. For, it maintained, "The most formidable weapon being used by the enemy today against our bomber offensive is his Fighter Force—his single engined fighters by day and his twin engined fighters by night—and the elimination or serious depletion of this force would be the greatest contribution to the furtherance of the joint heavy bomber offensive of the RAF and AAF."<sup>39</sup>

After the principal target systems had been determined, there remained to be elaborated an operating plan to accomplish the destruction of the seventy-six specific objectives of which those systems consisted. For this purpose General Eaker appointed a committee composed of Brig. Gen. Haywood S. Hansell, Jr., Brig. Gen. Frederick L. Anderson, and certain staff officers of the Eighth Air Force. To this group Air Chief Marshal Portal added, at Eaker's request, Air Cdre. Sidney O. Bufton. The committee's task was to decide, in the light of operating experience, what force of planes would be required to do the job and what chronological order of attack against the six target systems would make best use of the increasing forces being made available. This operational plan, together with the list of targets, became known as the "Plan for the Combined Bomber Offensive from the United Kingdom," or, more briefly, the CBO Plan. It received "unqualified endorsement" by the commanding general of ETOUSA, the

chief of Air Staff, RAF, and the air officer commanding in chief, RAF Bomber Command.<sup>40</sup> The latter emphasized in a letter to Eaker the "exactly complementary" function of the two bomber forces—one specially trained and equipped for night bombing, the other for bombing by daylight. His indorsement was, however, qualified on one point, namely the high priority given to the attack on submarine bases as distinct from the submarine building yards and ancillary factories.<sup>41</sup> Late in April, General Eaker brought the plan to Washington.<sup>42</sup>

It was a comprehensive and impressive report which Eaker presented to the JCS on 29 April 1943.<sup>43</sup> In order to accomplish the mission of the bomber offensive as set forth at Casablanca, the plan provided for the neutralization of a given percentage of each industrial system agreed upon. Destruction of the submarine building yards selected would reduce current submarine construction by 89 per cent. Destruction of 43 per cent of German fighter capacity and 65 per cent of German bomber production was provided for. Of the ball-bearing production, 76 per cent could be eliminated by destroying the targets selected. The attack on oil was made contingent upon plans to strike the Ploesti refineries from Mediterranean bases. Should that effort succeed, it would then, but only then, be necessary to attack the oil installations in the Ruhr in order to exploit the advantage gained in Rumania. Together these attacks would account for 48 per cent of Germany's oil production. Provision was next made for destroying 50 per cent of the synthetic rubber capacity and nearly all of the tire production of Axis Europe. Finally, the elimination of seven selected plants producing military transport and armored vehicles should have a considerable, though not readily measurable, effect on enemy strength.

But there was one overriding consideration which the planners declared would, temporarily at least, alter this order of priority. The CBO Plan warned that the Germans, recognizing the vulnerability of their vital industries, were rapidly increasing the strength of their fighter defenses, especially on the western front. The German fighters were taking constant toll of Allied bombing forces both by day and by night, "not only in terms of combat losses but more especially in terms of reduced tactical efficiency." If their number were materially increased, "it is quite conceivable that they could make our daylight bombing unprofitable and perhaps our night bombing too." For this reason, the plan concluded, with more force than clarity, "German

fighter strength must be considered as an *Intermediate* objective second to none in priority."<sup>44</sup>

As finally determined, target priority in the CBO Plan stood as follows:

- (1) Intermediate objectives:
  - German fighter strength
- (2) Primary objectives:
  - German submarine yards and bases
  - The remainder of the German aircraft industry
  - Ball bearings
  - Oil (contingent upon attacks against Ploesti from the Mediterranean)
- (3) Secondary objectives:
  - Synthetic rubber and tires
  - Military motor transport vehicles

It is not within the province of this chapter to evaluate the CBO in terms of positive results. But later events and subsequently acquired information cast on the planning phase a light the implications of which cannot at this point be entirely ignored. This is especially true with regard to target selection. Generally speaking, the bomber offensive succeeded. It is, therefore, not a question of explaining any failure in attaining ultimate objectives. But it now appears that over-all target selection might in a few instances have been improved and the bombing force have been utilized more effectively. Electric power might well have been given a high priority. Nonfriction bearings might well have been accorded a lower priority. Probably more important than either the inclusion of bearings or the exclusion of electric power was the failure to concentrate at an earlier date on oil and to appreciate the vital interdependence of synthetic oil, synthetic rubber, nitrogen, and other elements in the vast chemical complex. Submarine installations received no doubt an undue weight of bombs. But in that case the choice was dictated not by industrial analysis but by what was felt to be strategic necessity. The attack on transportation, when it came, was decisive, but it is probable that it could not have been undertaken directly at an earlier date without overwhelming force and complete concentration of effort. It must be remembered, of course, that contingent factors of a purely operational nature which could not have been foreseen affected the results of the offensive. The day bomber force, for example, was not built up as rapidly as had been planned, a fact which made it impossible to strike the ball-bearing industry as rapidly and decisively as had been anticipated. The CBO Plan had made it very



clear that a successful initial attack on that industry would demand the immediate concentration of effort on the remaining elements of that system in order to exploit the initial success. The fact remains, however, that the final choice of targets in April of 1943 did not correspond in every respect to the points of most extreme vulnerability in the German war economy.

Was, then, the method of industrial analysis, in this instance identified especially with the COA, an effective instrument for the appraisal of strategic objectives? Did it result in a more penetrating choice of target systems than had hitherto been achieved? It may be instructive before answering these questions to examine some of the priority lists which had been drawn up by U.S. agencies (British examples, since they were developed according to a different strategic and tactical doctrine, will be excluded) prior to the work of the COA.

AWPD-1, prepared at AAF Headquarters in August 1941, had envisaged a strategic bombardment attack on German industry by an American bomber force and arranged the targets in the following order of priority: electric power, transportation, oil and petroleum supplies, the morale of the German population.<sup>45</sup> Neutralization of the German Air Force, by attacks on air bases, aircraft factories (both engine and airframe), and aluminum and magnesium factories, was listed as an "intermediate" objective "whose accomplishment may be essential to the accomplishment of the principal objectives." In addition, other lines of action, such as the bombing of submarine bases, might possibly be forced by the necessity of maintaining the security of bases.

A "Plan for the Initiation of Air Force Bombardment in the British Isles," also emanating from Headquarters, AAF, and dated 20 March 1942, had selected some 144 targets within four categories in the following priority: munitions industry, electric and water power, petroleum and fuel, rail and water transportation.

AWPD-42, issued 9 September 1942, constituted the most thorough effort made up to that date by U.S. agencies. It had arrived at the following list:

- The GAF: fighter factories, bomber factories, and engine plants
- Submarine building yards
- Transportation system: building shops, repair works, marshalling yards, and canals
- Electric power
- Oil
- Aluminum
- Rubber

It was becoming a commonplace in strategic thinking that destruction of the GAF would be a prerequisite to any systematic reduction of Germany's war potential. And as the submarine menace mounted it was becoming clear that something drastic, involving temporary diversion of strategic bombing forces, would have to be done. These considerations in fact dictated the priorities for Eighth Air Force operations during the fall and winter of 1942. Both the directive under which the American bombers began their task and that of 20 October which supplemented it listed submarines, aircraft, and transportation in that order.\* Similarly, the Casablanca directive of 21 January 1943 had listed priority targets in the following order:† submarine construction yards, the aircraft industry, transportation, oil.

It is obvious that the CBO priorities came no nearer to the answer indicated by the postwar investigations of the Strategic Bombing Survey than did the earlier lists, and in some instances they failed to come as close. In other words, the systematic approach to the problem made by the COA attained in an over-all sense, if the conclusions of the USSBS be accepted as valid, an end result no more satisfactory than that achieved by the efforts of the earlier analysts. This fact, however, does not mean that the attempt to apply a more or less scientific method to the problem of target selection was badly conceived. It merely means that conditions were not entirely favorable to a project carried out at that level. Insofar as it was possible to solve the problem on the basis of facts, rather than of imponderables, there could be no limit to the valid application of a scientific method. And potentially the problem was one of ruthlessly factual investigation. But there existed in almost every instance a serious shortage of reliable information, and the resulting lacunae had to be bridged by intelligent guesswork and the clever use of analogies. In dealing with this mass of inexactitudes and approximations the social scientist finds himself in a position of no special advantage over the military strategist or any intelligent layman; and an elaborate methodology may even, by virtue of a considerable but unavoidably misdirected momentum, lead the investigator far afield. The moral of this story is obvious and has frequently been drawn. Strategic bombardment, probably more than any other strategic undertaking, requires the most complete body of intelligence data possible. Without it a strategic bombing campaign may succeed—the

\* See above, pp. 213-16, 237-38.

† See above, pp. 304-6.

one in question succeeded notably—but only at the expense of much ineffective effort.

### *The Operational Plan*

As presented by General Eaker, the plan of operations was divided into four phases, each marked by an increase in the size and capabilities of the American bombing force. In estimating the force required, the authors of the CBO Plan had recourse to the experience of the Eighth Air Force which, by April of 1943, represented a very useful body of information. They were not therefore forced, as the authors of AWPD-42 had been, to resort to highly theoretical calculations. From the experience of the Eighth in twelve missions against assorted targets it was concluded that 100 bombers dispatched on each successful mission would effect satisfactory destruction on that part of the target area within 1,000 feet of the aiming point when bombing from altitudes of 20,000 to 30,000 feet. Each target was accordingly evaluated in terms of the number of circles of 1,000-foot radius in which destructive effect had to be produced, and the total number of sorties required for total destruction was calculated on that basis. As for the rate of operations, the Eighth Air Force had averaged six per month over the preceding half year. Experience also indicated that at least 800 aircraft must be in the theater to make possible the dispatch of 300 on operations, and that 300 planes constituted the minimum necessary for deep penetrations in the face of existing fighter opposition.

By 30 June 1943, the CBO Plan recommended, there should be in the theater 944 heavy and 200 medium bombers. It would not, however, be possible much before that date to train the crews for the force of 800 planes required for deep penetrations. Consequently, missions during the first phase of operations (April to July) would be limited to the range of fighter escort or to attacks on objectives not demanding flights deep into enemy territory. Targets in this phase would consist mainly of submarine yards and not too distant aircraft installations. Only two systems called for long missions: an attack on oil installations at Ploesti and a very long-range attack against the Schweinfurt ball-bearing industry. During the next phase, from July to October, the strength in heavy bombers should reach 1,192 and objectives might be selected within a radius of 400 miles from the base area in England. Effort would be concentrated against German fighter assembly and fighter aircraft factories as well as airdromes and repair facilities. Probably 75

per cent of the striking force would be used for this purpose, the remaining 25 per cent being left to continue the attack on submarine construction yards. During the third phase, from October to January, the German fighter force would continue to be attacked and the other sources of German power would be undermined. During this phase the bombing force would have to be adequate to perform all its major tasks; by January 1944 it should number 1,746 heavy bombers. The final phase, during the early months of 1944, should see the entire bombing force used to sustain the effect already produced and to prepare the way for a combined operation on the continent. To accomplish these tasks, 2,702 heavy bombers would be needed by 31 March 1944.

The plan made no specific provision for the use of U.S. medium bombardment. But it clearly indicated that medium bombers would be required for supplementary attacks against all strategic targets within their range. They would be especially useful for attacking German fighter airdromes in order to aid the passage of the heavy bombers until the bombing of the enemy aircraft industry had made itself felt. For these purposes, and for the final phase in support of cross-Channel operations, an eventual force of 800 medium bombers should be in the theater by 31 March 1944. In addition, of course, there would at all times be a need for an extensive American fighter force to protect the bombers and to assist in the reduction of German fighter strength.

For the integration of RAF and USAAF operations in the combined offensive, the CBO Plan made only a surprisingly informal provision. "Fortunately," it said, the capabilities of the two forces were "entirely complementary." It argued that the most effective results from strategic bombing would be obtained by directing the combined day and night efforts of the U.S. and British bomber forces to all-out attacks against targets which were mutually complementary, in a campaign to undermine decisively a limited number of selected target systems. The American bombers would thus, in general, bomb specific industrial objectives by day, and the RAF would ordinarily attack by night the cities associated with these objectives, the timing to depend on the tactical situation.

This plan does not attempt to prescribe the major effort of the R.A.F. Bomber Command. It simply recognizes the fact that when precision targets are bombed by the Eighth Air Force in daylight, the effort should be complemented and completed by R.A.F. bombing attacks against the surrounding industrial area at night. Fortunately the industrial areas to be attacked are in most cases identical

with the industrial areas which the British Bomber Command has selected for mass destruction anyway. They include HAMBURG, BREMEN, HANOVER, BERLIN, LEIPZIG, WILHELMSHAVEN, BREMERSHIRE [BREMERHAVEN?], COLOGNE, STUTTGART, and many other principal cities. They also, of course, include smaller towns whose principal significance is coupled with the precision targets prescribed for the Eighth Air Force.

In the course of its passage through the JCS the plan encountered little opposition. Whatever discussion took place centered on the proposed commitment of forces. General Arnold advocated that allocation of U.S. bombardment to the combined offensive should be made substantially as set forth by General Eaker.<sup>46</sup> The Navy members, however, raised some objection to making too firm a commitment in view of the acute shipping problem; and they recalled a decision of the CCS concerning priority of future operations in which SICKLE, together with TORCH and HUSKY, had been bracketed with operations in the Southwest Pacific. Nevertheless, on 4 May the JCS approved the CBO Plan as presented by Eaker and recommended implementing it to the maximum extent practicable, consistent with aircraft production, available shipping, and current strategic commitments.<sup>47</sup> On 14 May the JCS presented the plan to the Combined Chiefs, who were meeting in Washington in connection with the TRIDENT conference. In a memo dated on the preceding day, the JCS had recommended, first, that the CBO be given top priority in build-up and its execution facilitated and, second, that its progress be watched continuously with an eye to determining a date for cross-Channel operations.<sup>48</sup>

Before the CCS could accept the plan, including the commitment of forces it required, certain strategic decisions had to be made involving the entire course of the European war. It was no longer a question of approving the concept of a combined bomber offensive. That had been settled at Casablanca, where that campaign was inseparably linked with the ROUNDUP operation; and since all parties still agreed at TRIDENT that a cross-Channel invasion was a prerequisite to defeat of the European Axis, the CBO remained unquestionably part of Allied strategy. Rather it was a question of determining what priority the bomber offensive should be given among other major undertakings in the allocation of forces. British and U.S. strategists had come to the conference with divergent views regarding the best disposition of Allied forces after the accomplishment of HUSKY. The American representatives argued, as at Casablanca, in favor of gathering forces in the United Kingdom as rapidly as possible in preparation for an inva-

sion of western Europe at the earliest practicable date. The British, with equal consistency, advocated further large-scale campaigns in the Mediterranean on the ground that such operations would, by eliminating Italy and seriously dispersing German forces, make ROUNDUP more certain of success. With the American view, the CBO Plan, calling as it did for a cross-Channel invasion as soon as the bomber offensive had completed its final phase in April 1944, was in perfect accord. The British, on the other hand, were reluctant to make too firm a commitment in that direction for fear it might "tie our hands" regarding plans in other directions.<sup>49</sup>

At the same time the British representatives agreed that the intensity of the bombing campaign would have a material effect on any land operation, whether in northwestern Europe or in the Mediterranean area, and that it should not be reduced except after "critical examination." Sir Charles Portal, without maintaining that the utmost priority should continue to be accorded to SICKLE, expressed deep concern for the rate of that undertaking. The important thing about the CBO Plan, he emphasized, was to be found not so much in the "tremendous effect" it promised on German production and morale as in the proposed elimination of the German fighter force which, he believed, was growing so rapidly that every week's delay made the task of defeating Germany more difficult, no matter where the principal effort was to be applied.<sup>50</sup>

On 18 May, after considerable discussion, the CCS approved the CBO Plan as presented.<sup>51</sup> And the conference finally decided that the CBO would, as planned, culminate in a cross-Channel invasion for which 1 May 1944 was selected as the target date. Operations in the Mediterranean were to consist only of action calculated to eliminate Italy. In addition, it was decided to launch bombing attacks as soon as possible from Mediterranean bases against the Ploesti oil fields. The question of priority among these specific undertakings for 1943 and 1944 was happily avoided, for, after balancing available resources with requirements more thoroughly than at any previous meeting, the conference concluded that all were possible and that, broadly speaking, "there are sufficient air forces to meet all requirements in all Theaters."<sup>52</sup>

In compliance with the decisions made at TRIDENT, the chief of Air Staff, RAF, in whose hands, as agent of the CCS, the direction of the bomber offensive rested, issued on 10 June 1943 to the commanding



officers of RAF Bomber Command and Fighter Command and to the commanding general of the Eighth Air Force a directive to govern the CBO. This paper confirmed the primary object of the bombing campaign as set forth at Casablanca and incorporated the essential elements of the CBO Plan as adopted at TRIDENT. It made clear, however, that the target priorities stated in the parent document were being assigned primarily to the Eighth Air Force. Of the "combined" nature of the projected operations, it was stated: "While the forces of the British Bomber Command will be employed in accordance with their main aim in the general disorganization of German industry their action will be designed as far as practicable to be complementary to the operations of the Eighth Air Force." British Fighter Command would, "consistent with the needs of the air defence of the United Kingdom" (which, by the way, had been left entirely up to the RAF), be employed to further the bomber offensive. The American fighter forces would also be employed in the furtherance of the bomber offensive in accordance with the instructions of the commanding general of the Eighth Air Force and in cooperation with forces of RAF Fighter Command. The allocation of targets and "the effective coordination of the forces involved" was to be insured by "frequent consultation between the Commanders concerned."<sup>53</sup>

Even if the operations of the British and American forces were, as it appeared in this directive, to be less closely integrated than had been envisaged in the CBO Plan, the problem of coordination remained an important one. At Casablanca it had been generally assumed that the chief of Air Staff, RAF, would supervise the combined offensive as agent for the CCS, but no specific machinery had been set up by which the two forces could coordinate their plans. In this respect the CBO Plan added nothing to the Casablanca discussions. On receiving the CBO Plan, General Arnold wrote to Sir Charles Portal urging the creation of "somewhat more formalized machinery for closest possible coordination, or rather, integration, of the two bomber efforts." For, he added, "the increasing complexity of their operations would appear to me as soon to be beyond the capabilities of the commanders, in person, to coordinate." He accordingly suggested that a permanent committee be established for this purpose, to operate within the limits of the Casablanca decisions.<sup>54</sup>

Under separate directive of 10 June 1943, the Combined Operational Planning Committee was set up. That body was to consist of represent-

atives from RAF Bomber and Fighter Commands, Eighth Air Force headquarters, VIII Bomber Command, and VIII Fighter Command. An Air Ministry representative from the Directorate of Bomber Operations would be available "to be co-opted as necessary for purposes of liaison with the Air Staff." It was made clear that the committee was to be concerned with coordination and tactical plans for specific combined operations, which should be prepared well in advance of requirements, and with critical examination of the tactical execution of these plans. It was in no way responsible for the conduct of operations, which remained the responsibility of the commanders concerned. It was an advisory, not an executive, body.<sup>55</sup> Furthermore, it was conceived primarily with the daylight bombing campaign in mind. The planning committee thus became, in effect, "merely an additional means of liaison with the Americans on any tactical questions which might be common to both."<sup>56</sup>

Despite such arrangements as these, or perhaps because of them, a weakness remained in the organization of the CBO. The CBO Plan and especially the governing directive of 10 June 1943 purposely avoided committing the RAF to a rigid adherence to the particular objectives they set forth. The action of the Eighth Air Force, for which these target systems were primarily devised, would "as far as practicable" be complemented by that of RAF Bomber Command. It was "fortunate" that the objectives of the two forces would for the most part coincide, but it was also fortuitous: such coincidence of effort was not made explicitly a necessary part of the plan, however much the authors may have considered it desirable. The British and American forces were still engaged in bombing the enemy according to widely divergent operational theories; and, insofar as the RAF hoped to bring about a general disorganization of the German economy by attacking civilian morale as a primary objective, its strategic doctrine differed radically from that upon which the CBO Plan had been erected. It was probably inevitable, therefore, that the two forces would continue to operate along lines not so nearly parallel as some of the Americans originally had assumed. The combined bombing effort did not in fact achieve close integration until late in the campaign, when the weight of the American attack had made the distinction between pinpoint and area bombing a shadowy one and when the importance of enemy oil and transportation had become so apparent as to leave little doubt regarding the primary objectives. Meanwhile, the participants labored at

times under a sense of frustration originating in the largely unresolved dichotomy that continued to characterize the bomber offensive.

At the time of the issuance of the directives of 10 June, Maj. Gen. Follett Bradley, air inspector of the AAF, had already completed a study of the entire problem of the build-up for the bomber offensive and for the invasion of western Europe scheduled to follow hard upon the CBO's completion. The logistical experience of the preceding months had exercised a sobering influence on all Allied planning, and at the TRIDENT conference it had been recognized that the discussions at Casablanca had taken too little account of limitations both in resources and in shipping.<sup>57</sup> The TRIDENT debates reflected a deep concern over the problem of shipping and an understanding that if the bomber offensive were to be accomplished the USAAF would have to be given top priority in shipping.<sup>58</sup> In the light of the detailed CBO Plan, the Combined Staff Planners had estimated that U.S. heavy bombardment in the United Kingdom would have to reach a maximum of fifty-one groups by 1 January 1944.<sup>59</sup> This represented a marked increase over the hitherto generally accepted final figure of forty-five or forty-six heavy groups, which, moreover, had not been planned for complete deployment prior to March 1944. It appears, nevertheless, that the goal of fifty-one groups, advanced in date to March 1944, became in June 1943 the current planning objective.<sup>60</sup>

The effective bombardment strength of the Eighth Air Force had doubled during May, going from six to twelve heavy groups.<sup>61</sup> HUSKY, scheduled for early July, and other operations "subsequent to TORCH" would continue to draw heavily upon AAF resources. But the overriding requirements of the Mediterranean operations had decreased appreciably, and both men and materiel had begun once more to flow toward the United Kingdom.\* The AAF would soon face its long-awaited opportunity to prove its most cherished theories.

\* Logistical problems are more fully discussed in chaps. 18 and 19 below.

## CHAPTER 12

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### *THE ANTISUBMARINE COMMAND*

WHILE the AAF was preparing its major air offensive against Hitler's European stronghold, it was also engaged effectively, if somewhat anomalously, in hunting submarines. This enterprise, on which the newly activated Army Air Forces Antisubmarine Command (AAFAC) embarked in October 1942,\* formed an integral part of the air effort in the west, for until the summer of 1943 the U-boats remained the gravest threat to that build-up of forces, both air and surface, on which the long-range air plans depended. Moreover, the aircraft on antisubmarine duty operated during that same period in a campaign calculated to complement exactly the bombing of the European U-boat bases by the RAF and the Eighth Air Force.† But the story of the AAFAC reaches beyond the strategic situation in the Atlantic. It involves a controversy concerning the control and use of long-range, land-based aircraft which raised certain fundamental issues of American military organization and which culminated in one of the key decisions made in that regard during the war. In this debate the AAFAC became a test case, with the result that its exploits, though by no means inconsiderable, are overshadowed by the larger issues of policy.

The new command faced large and complex problems of organization and build-up. Not only did it have to increase its effective strength as rapidly as possible but to meet its enlarged obligations it had also to inaugurate an entirely new training program, new supply procedures,

\* The beginning of AAF antisubmarine operations and the steps leading up to the organization of this command have been discussed in Vol. I, chap. 15.

† See above, pp. 246-54, 311-17.

and a new administrative machinery for coordinating research in the tactics and techniques of antisubmarine warfare. The efforts of its predecessor and parent, the I Bomber Command, had been handicapped by the fact that the task allocated to it was presumably a temporary one.<sup>1</sup> Now, as an officially constituted antisubmarine unit, the AAFAC was able to attack its problems with undivided energy, free at least from any immediate uncertainty as to its mission.

The command began operations with substantially the same units and equipment as had been employed against the U-boats by the I Bomber Command. Its squadrons were, on 20 November 1942, organized into two wings (the 25th and 26th Antisubmarine Wings) with headquarters at New York and Miami and operating in the Eastern and Gulf sea frontiers, respectively. Command headquarters remained in New York City. Equipment at first available proved seriously limited in the critical category of long-range bombardment. But steps were at once taken to remedy that situation. By the end of the following summer the command consisted of twenty-five squadrons, most of which were equipped with B-24's modified for antisubmarine work.<sup>2</sup>

Immediately after its activation the AAFAC began to extend the range of its activities beyond the western Atlantic. In November 1942, two of its squadrons, flying radar-equipped B-24's, moved to England. Later on, other units were sent overseas. In all, six squadrons served at one time or another in the eastern Atlantic areas—in the Bay of Biscay and Moroccan areas to be specific. Still other units operated in 1943 off Newfoundland and in the Caribbean.

This extension of AAF antisubmarine operations was dictated by a fundamental change in German strategy in the Atlantic, a change which took place at about the same time as the activation of the new command. Since May 1942 the Germans had been gradually withdrawing their U-boats from the U.S. coastal waters. By September they had abandoned the policy of attacking merchant shipping wherever it might be found in profitable lots and had begun to concentrate their forces in the Atlantic convoy lanes, which by the fall of that year were obviously carrying the materiel for a major offensive. Little enemy activity remained in the western Atlantic except in the still vulnerable Trinidad area and except for a few nuisance raiders sent to keep as large antisubmarine forces as possible tied down to patrolling the U.S. coast line.<sup>3</sup> This shift of enemy strategy called for a similar shift in Allied

strategy; and since it was on the enemy's part essentially a shift from offense to defense, it pointed toward a corresponding change in American policy from defense to a vigorous offense. During these late summer and fall months, moreover, the Allies were preparing for the TORCH invasion. That enterprise, it was clear, would need all possible protection against submarine attacks, not only in the convoy lanes from the United States to the United Kingdom but eventually in the waters off Gibraltar and northwestern Africa.

A review of antisubmarine measures was thus in order. Old questions regarding the strategy and organization of the antisubmarine campaign, never satisfactorily settled, began again to render unstable the relationship between the services and to imperil a vital sector of the Allied war effort. It again became a crucial question whether the extended antisubmarine war should proceed on essentially offensive lines, carrying the battle to the enemy as briskly as resources would permit, or whether it should consist primarily of extended convoy coverage. And it again became a subject for protracted debate whether the long-range, land-based aviation engaged in the campaign should be controlled ultimately by the Army or the Navy.

Although the AAFAC had been conceived originally as a unit whose permanent field of operations should be the U.S. Atlantic coast, the Gulf, and the Caribbean, it did not take the War Department long to recognize the need for extending its activities beyond the western Atlantic. Influenced no doubt by the impending African invasion, General Marshall and the rest of the U.S. Army command who were concerned in the matter had come to this conclusion as early as August 1942. In December the scope of AAFAC operations was officially broadened to include the destruction of submarines "wherever they may be operating in opposition to our war effort."<sup>4</sup>

But it was clear that a mission thus enlarged would require a correspondingly enlarged force. Brig. Gen. Westside T. Larson, commanding general of AAFAC, felt that his force was quite inadequate. By January 1943 it consisted of 19 squadrons operating a total of 209 planes, of which only 20 were B-24's, the type already recognized as the best weapon then available for the purpose.<sup>5</sup> Steps, though not such long ones as Larson had anticipated, were accordingly taken to provide the necessary force. AAF Headquarters made it clear that the AAFAC was intended to be "a highly mobile striking force" which at no time would "become confined to a stabilized effort," but would



operate "where operation is most profitable." In view of these considerations its immediate objective had been limited to 228 B-24's. In the absence of fully adequate forces, those that were available had to be utilized to the utmost, a process which would involve rapid movement from one threatened area to another. In other words, mobility was considered essential not only to the tactical and strategic situations but to the logistical as well.<sup>6</sup>

### *Strategic Issues*

Implicit in these plans for expansion lay a doctrine of the offensive which had characterized AAF thinking ever since it had been turned in the direction of the U-boat war.<sup>7</sup> The AAF was not, however, alone in its opinion. From the Antisubmarine Warfare Operations Research Group (a subsidiary of the National Defense Research Council) and from the Joint U.S. Committee on New Weapons and Equipment came, at the turn of the year, opinions strongly in favor of an aerial offensive launched against the U-boats at sea in their areas of greatest concentration, a concept founded upon the remarkable searching and striking power of long-range, land-based aircraft. The Joint Committee advocated the creation of special groups organized for the specific purpose of killing submarines. Both agencies criticized the Navy policy of employing AAF antisubmarine aircraft defensively in convoy escort and in patrol of the home waters in which few if any submarines were still active.<sup>8</sup>

Certain other sources—Army sources—expressed qualified approval of the "killer-hunt" idea. For example, on the basis of a study made during the fall of 1942, Brig. Gen. C. W. Russell, Army liaison officer for antisubmarine warfare, pointed out some facts which he felt were inescapable. Defensive methods currently employed against the U-boats were obviously inadequate. It was equally obvious that "the more submarines there are operating, the more merchant vessels will be sunk." All of which pointed to the adoption of "persistent offensive measures." But he was not at all sure that action in the open sea was the type of offensive required. Many attacks had been made at sea, both by air and surface craft, but few had met with success. Equipment, he thought, fell short as yet of the lethal requirement for destroying U-boats. Rather he advocated a project which enjoyed a considerable vogue during the latter part of 1942 and the early months of 1943 among both Army and Navy planners, namely, an attack on the sub-

marines in the yards where they were built and the bases at which they were serviced. In January he was able to cite in support of his estimate of the situation what he believed to be the very effective bombing of French submarine bases by the Eighth Air Force. Without specifically discrediting the air offensive at sea, he stressed first of all the bombing of yards and bases and secondarily the extension of long-range air cover for the vital North Atlantic convoy route.<sup>9</sup>

This seems also to have been the general tone of official AAF policy during the early weeks of 1943.<sup>10</sup> But headquarters offices were admittedly groping in the dark. It was hard to tell just how effective the bombing of U-boat bases had been. And it was even harder to estimate exactly the effectiveness of the campaign against the U-boat at sea. Furthermore, the American forces had not as yet gained enough experience to serve as a basis for anything more than a reasoned conjecture. The British were able to draw on longer experience; yet even their experience seemed at the turn of the year to be still far from conclusive.

In February, however, the offensive against U-boat concentrations in the Bay of Biscay, in which the RAF Coastal Command had been engaged for some months, began to yield certain results the implications of which encouraged the exponents of an offensive at sea. The fact that two squadrons detached from the AAFAC took part in the February action in that area gave it added meaning to American observers. By the beginning of 1943 this offensive had become the pivotal point for the British air effort against the submarine. The theory upon which it was based was simple and logical. It had been known for a long time that most of the U-boats operating in the Atlantic were based on the west coast of France. In order to leave these ports for operations against Atlantic shipping and to return for repair and servicing, practically the entire enemy submarine fleet would, it was believed, have to pass through the Bay of Biscay. Thus there would always be a high concentration of U-boats in that relatively restricted area. Moreover, in crossing this transit area the U-boats would be obliged to spend an appreciable portion of their time on the surface in order to recharge their batteries. The bay, in other words, formed a bottleneck through which most submarines had to pass and in which they could not, as in the open sea, choose the time and place of their appearance on the surface. It therefore appeared to RAF Coastal Command that a sufficient air force properly and consistently employed in these waters would be

enough eventually to strangle the enemy submarine campaign, for the Germans could not abandon the bay ports for bases in Norway without running the risks of a similar air concentration in a similar transit area off Scotland and Ireland.<sup>11</sup>

The chief problem was to secure the necessary long-range force and to balance it so that the area could be effectively patrolled both by day and by night. It did not have to be a large force. One British analyst estimated that forty long-range aircraft adequately equipped with a radar device which the Germans could not detect would be enough to cause the enemy to abandon the bay ports. It was in this category of long-range, radar-equipped planes that the two AAFAC squadrons made their initial contribution.<sup>12</sup>

Originally earmarked for service with the Twelfth Air Force in connection with TORCH and in the fall and winter dispatched to England to be trained in Coastal Command methods, the 1st and 2d Antisubmarine Squadrons\* soon found their plans altered. To carry on the bay offensive the British needed long-range aircraft, for only long-range flying could break the endurance of the U-boat and with any certainty catch the submarine on the surface. And it needed the ASV-10 radar with which the American planes were equipped, for the British ASV-2 equipment had been seriously compromised by German detecting devices. It had accordingly been decided to use the two American B-24 squadrons to supplement the few available long-range British planes.<sup>13</sup> A plan was evolved early in 1943 according to which an area in the bay, through which it was estimated the enemy would have to pass, would for a limited period be subjected to concentrated and systematic air patrol. The long-range aircraft were given the more distant part of this area, thus allowing the medium equipment to be concentrated in the inner area.<sup>14</sup>

In view of the then chronic shortage of aircraft and the necessarily intense effort of this operation, the patrol had been planned to continue for only nine days. And it had been timed to coincide with an anticipated influx of U-boats returning from two convoy battles. The period of actual action was 6 to 15 February 1943. Results confirmed the wisdom of the plan. Fourteen sightings resulted in nine attacks in the outer area. Only four sightings and one attack were made in the inner area. Of special interest to American observers was the fact that of the

\* These units were subsequently organized into the 480th Antisubmarine Group under the command of Col. Jack Roberts.

contacts made in the outer area, 90 per cent were by American aircraft, a record which elicited a hearty commendation from the British command under whose control they had operated.<sup>15</sup>

This brief campaign had given some indication of what an organized offensive against the U-boats at sea might do when judiciously directed. It had also given some indication of the way in which the B-24's could be employed in such an action. The evidence in both instances pointed to the wisdom of using the Army planes in just such an offensive. Further encouragement for emphasis on an aggressive sea-search-attack policy came from an exhaustive study of the submarine situation prepared early in March by AC/AS, Intelligence. This report pointed out that the effect of air patrol could not be measured entirely in terms of U-boats sunk, that, in fact, it was quite possible to limit submarine action simply by such harrying tactics as had been employed in the Bay of Biscay, where air antisubmarine forces, although they sank relatively few of the submarines they attacked, had nonetheless managed to give the enemy craft such a bad time in the transit area that their effectiveness in the critical convoy lanes was thought to have been sharply reduced.<sup>16</sup>

By March, then, AAF antisubmarine policy had become relatively clear. It advocated an increased air effort in which the bombing of submarine bases, air cover for convoys, and an independent air offensive each had its own peculiar function, but a function not to be emphasized at the expense of the others. But if the AAF planners had reached some agreement as to the employment of the Army antisubmarine aircraft, the same could not be said of the higher echelons. By March the chronic disagreement on this point between Army and Navy was, in fact, nearing a climax.

During February the Germans had launched their spring U-boat offensive. Merchant vessel sinkings, after having decreased materially during December and January, took a sudden upward turn, especially along the North Atlantic convoy route. The situation called for drastic measures, but there remained a radical disagreement regarding the nature of such measures. The AAF continued to advance its doctrine of the independent air offensive. Naval authorities, in particular Admiral King, who remained unimpressed by the Biscay offensive and by the idea of "killer groups" in general, continued to invest their hopes in defensive measures and stressed the need for more Army B-24's to operate from Newfoundland in order to cover that heretofore espe-

cially dangerous leg of the journey from American ports to Europe.<sup>17</sup> Given unlimited supplies of trained men and specialized equipment, both sides might easily have justified their plans, each as part of a coordinated campaign. The disagreement was not absolute. Rather it was a matter of emphasis. But given strictly limited resources, the plan to which primary emphasis was given would, it was clear, be implemented only at the expense of the other. And so, lacking the seeds of compromise, the discussion promised little in the way of a settlement satisfactory to both sides.<sup>18</sup>

### *The Debate over Control*

Parallel with the debate over doctrine ran a discussion of organization. The doctrinal issue as it unfolded suggested that some reorganization of command would be needed. The nature of the antisubmarine war remained such as to demand as nearly absolute cooperation between the commands and services involved as was humanly possible. It was the old story over again, reminiscent of the days before the AAFAC was activated.<sup>19</sup> The German submarine fleet, under a single commander and deployed within a large strategic plan, possessed the great advantage of flexibility; and, being flexible, it was able to retain a considerable degree of initiative in the Atlantic even after it had been forced by considerations beyond its control to concentrate its efforts defensively against the "invasion" convoys. In contrast, the antisubmarine forces suffered from complicated and divided command and from a wasteful duplication of effort.<sup>20</sup>

Little attempt had been made to standardize communications, intelligence reporting, training, or tactical doctrine, either among the nations concerned or between the U.S. Army and the U.S. Navy. As a consequence, each agency felt that, in order to discharge its obligation, it would have to plan a much larger program than would have been required in a strictly integrated plan. Finally, no single commander existed, either for all Allied forces or for those of the United States in particular, whose sole responsibility it was to prosecute antisubmarine warfare and to move antisubmarine forces as the tactical situation indicated. Within the U.S. forces, this problem presented itself in especially aggravated form. Although the Navy exercised operational control over all American antisubmarine operations, it had as yet no integrated system for exercising that control. As in the spring of 1942, the job still fell largely to the various sea frontier commanders, who had other

responsibilities and who served under the over-all control of the commander in chief, U.S. Fleet, whose office had also many other things to do.<sup>21</sup>

Furthermore, the U.S. Navy tended to define the "operational control" it exercised over Army air units in terms of detailed supervision through lower-echelon commands rather than of broad policy which would leave day-to-day operations largely up to the air commanders as was the practice governing RAF Coastal Command under operational control of the Royal Navy. Ever since it had become evident in the summer of 1942 that the AAF was likely to be engaged in antisubmarine warfare on a more than temporary basis, those in charge of its antisubmarine activities had pointed to Coastal Command as the shining example of interservice cooperation.\* Under the general control of the Royal Navy, Coastal Command enjoyed all the freedom it required in developing its tactics and techniques and in coordinating its daily operations. To the U.S. Navy the AAF units remained temporary additions to its forces, operating "in lieu of"† Navy squadrons; and it consequently treated them as it would its own units, with perhaps a slight difference in that it continued to doubt the ability of Army aviation to navigate over water.

The AAFAC complained bitterly of the maladjustments it felt resulted from the existing system of operational control. Organized, trained, and equipped under the administration of the AAF, and indoctrinated with the bias of the parent headquarters in favor of the independent air offensive, it failed to fit into the Navy system. Its flyers resented having to work with naval commanders who, they felt, did not always understand their training, equipment, or tactical doctrine. Most of the AAFAC squadrons, moreover, remained in the western Atlantic areas long after the U-boats had for all practical purposes left those waters; and their crews, flying thousands of hours without sight of a submarine, felt their morale sink lower by the month as they heard with envy of the action their fellows were seeing in the eastern Atlantic. As for the two squadrons in England, their position was anomalous. Without wing organization in which they might have found some degree of

\* See Vol. I, 540-41. Cf. S. E. Morison, *History of United States Naval Operations in World War II*, Vol. I, *The Battle of the Atlantic*, pp. 237-47.

† See Vol. I, 540, for a discussion of the agreement known as "Joint Action of the Army and Navy, 1935" in which appears this principle of employing the forces of one service "in lieu of" those of the other.



autonomy, they had to operate on a detached service status under a foreign (though basically very congenial) command; and when in March 1943 they moved to North Africa they had to cope with a bitterly disputed area jurisdiction. Any attempt to move the AAFAC units involved slow liaison between War and Navy departments, or even between the Allied commands.<sup>22</sup>

All agencies concerned recognized the need for some sort of reorganization of the antisubmarine effort; and in January the subject became the object of joint study in the War and Navy departments.<sup>23</sup> The plan presented by the AAF planners involved an increased emphasis on organizational and technical developments which would increase the effectiveness of action against the submarines at sea. Each of the major Allied nations concerned in the antisubmarine war, it was suggested, should create a task force under a single commander who would control all national anti-U-boat operations. All national air and surface forces (the latter including carriers) should be placed under an air and a surface commander, respectively. All Allied antisubmarine forces in the Atlantic should be placed under one commander who would have no other responsibility; and this over-all commander should be given a deputy for the air and one for the surface forces operating in the Atlantic.<sup>24</sup>

This official AAF position, although less radical than some (including the recommendation made in January by the Joint U.S. Committee on New Weapons and Equipment<sup>25</sup>), met consistent opposition from the Navy planners, who maintained their position in regard both to organization and to underlying strategic concepts and who appeared especially concerned to avoid any sort of agreement which would restrict the right of the Navy to reorganize the forces within its responsibility according to its own principles. The result was a compromise paper which, in order to keep off the toes of either party, lacked specific recommendations and was therefore of little practical value.<sup>26</sup> On 30 April 1943, after nearly four months of discussion, this inconclusive paper was approved by the Joint and Combined Chiefs of Staff "in principle" and passed on to the interested agencies for "guidance" and "appropriate action." More positive action had been forestalled by Admiral King, who feared that the effect would be to restrict rather than to improve antisubmarine operations.<sup>27</sup>

During the spring of 1943, then, the problem of organization was being weighed without more result than an uneasy agreement that

some reform, in the direction of closer integration of authority, would be desirable. Meanwhile, the rugged logic of events was fast outrunning the more academic thinking that prevailed in the conferences. By March the situation in the North Atlantic had become so grave that President Roosevelt, on the 18th, wrote as follows to General Marshall and Admiral King: "Since the rate of sinking of our merchant ships in the North Atlantic during the past week has increased at a rate that threatens seriously the security of Great Britain, and therefore both 'Husky' and 'Bolero,' it seems evident that every available weapon must be used at once to counteract the enemy submarine campaign."<sup>28</sup>

Both Army and Navy high commands had come to about the same conclusion, and every effort was made during the spring of 1943 to strengthen the antisubmarine striking force. In accordance with the recommendations of the Atlantic Convoy Conference (a meeting early in March of British, Canadian, and American authorities concerned with the antisubmarine war), the Combined Chiefs of Staff undertook to provide extended air coverage for the critical leg of the northern convoy route that lay some hundreds of miles to the east of Newfoundland.<sup>29</sup> Specifically, they committed their respective countries to supply by 1 July 1943 the necessary VLR aircraft according to the following schedules:

USAAF	75
U.S. Navy	60
RAF	105
RCAF	15
<b>TOTAL</b>	<b>255</b>

This was generally admitted to be a minimum effort, calculated to do little more than strengthen the defensive system along the North Atlantic convoy route. Extended offensive operations would obviously require a still larger force of VLR planes. In particular the Bay of Biscay offensive, if pressed to the extent urged since March by the British, would require 160 VLR, ASV-equipped aircraft over and above the 100 planes being used in April by RAF Coastal Command in that campaign.<sup>30</sup> Such offensive operations had always received much support within the AAF, especially by the AAFAC, and through April and May it was receiving increasing support from the U.S. Navy.<sup>31</sup> The problem was to secure the aircraft. Any increase in VLR forces would, as the British pointed out, have to come from American production of B-24's; it was also clear that additional B-24's for antisub-

marine activity would have to come primarily from AAF allocations. Although the Navy had by 1 April 1943 received 112 B-24's from Army contracts,\* it had employed them primarily in the Pacific, and the decision to use 60 to reinforce the Atlantic convoy routes appeared to be the maximum diversion the Navy could make from its Pacific operations. The AAF also had commitments elsewhere. The bomber offensive against Germany had by 1943 been given an unassailable and vital place in Allied strategy, and its success depended entirely on the provision of sufficient heavy bomber forces to the Eighth Air Force. By midsummer the build-up of the Eighth was already over 200 heavy bombers behind schedule,<sup>32</sup> and General Arnold was inclined to examine any further diversion from this priority campaign with an extremely critical eye.<sup>33</sup> By April of 1943, however, the submarine situation had become so critical that General Arnold, under some pressure from Secretary Stimson and the War Department, took action not only to reinforce the North Atlantic route by sending additional B-24's to Newfoundland but to secure such increased allocation of B-24's for the AAFAC as to give that organization by the end of the year a total of 405 planes.<sup>†34</sup>

There remained the problem of making the antisubmarine machinery, thus fueled, operate both effectively and economically. And that meant, in circumstances then existing, some radical reorganization, a prospect which discussions at the highest level had rendered discouraging in the extreme. Nevertheless, General Marshall sought in the middle of April to revive the flagging effort to reform the antisubmarine campaign.<sup>35</sup>

In this effort he enjoyed the strong support of Secretary Stimson<sup>36</sup> and Dr. Edward L. Bowles. The latter, who had worked in the closest cooperation with Mr. Stimson as special consultant and remained throughout its history the sage of the Army antisubmarine program, had in March stated what might be termed the strictly logical Army policy with regard to the control of VLR aircraft engaged in the anti-U-boat war. Dr. Bowles' recommendations arose from four fundamental assumptions: (1) that the problem of antisubmarine warfare, since on it depended the Army mission in Europe, was essentially an

\* For full figures on B-24 deliveries to the Navy see Vol. I, 551.

† This would mean twelve B-24's for each of the twenty-five combat squadrons and for the two OTU squadrons, plus an additional 25 per cent reserve.

Army problem; (2) that offensive tactics, both against the submarine breeding grounds and on the open sea, could alone reduce the U-boat fleet and therefore the mounting menace to vital Allied shipping; (3) that the long-range, land-based bomber was the most useful weapon then available in this offensive strategy; and (4) that an effective use of this weapon depended on a closely coordinated and independent antisubmarine command. Together, these assumptions led to certain conclusions concerning organization. First of all, antisubmarine forces, whether surface craft or aircraft, Army or Navy, should be consolidated under one head who should have the freedom of action and the status of a theater commander. Secondly, the man to whom the responsibility would be intrusted for the safety of supply to the overseas troops ought to be an Army man, for "the U-boat is primarily a weapon against supply, not against naval fleets." Finally, since "past difficulties have in no small measure stemmed from a failure to realize the effectiveness of air attack on the U-boat," the new commander and the new organization should be such as to give to the air arm "the greatest possible mobility and freedom of initiative."<sup>37</sup> Secretary Stimson gave this analysis by Dr. Bowles his hearty indorsement and declared himself against any compromise arrangement which would not allow "full operational freedom to the Army in the command of killer planes."<sup>38</sup>

General Marshall appears, however, to have recognized the futility of proposing a plan of organization as favorable to direct Army control as that toward which Bowles' argument would have led. In a memorandum to the Joint Chiefs of Staff, dated 19 April 1943, he declared himself strongly of the opinion that the ultimate solution for the employment of the air arm in antisubmarine operations "particularly, and possibly exclusively as applied to VLR aircraft" could only be found in a unified command responsible for that type of operation. If such an authority could be set up, the result would be to override the limiting effect of the system of naval districts and sea frontiers under which the air arm had been forced to operate. If such authority could not be determined, he felt "we will tend to limp along under unavoidable difficulties that always exist when a new procedure has to develop under normal staff routine and operational organization." He therefore proposed that the U.S. shore-based air forces on antisubmarine duty in the Atlantic be organized to provide "highly mobile striking forces" for offensive action in addition to convoy coverage "in certain critical

areas"\* and that this command operate directly under the Joint Chiefs of Staff in a manner similar to that of a theater commander. Moreover, in view of the urgency of the situation, General Marshall added that the Army and Navy should each provide VLR B-24's for this command at the rate of twelve per month during May, June, and July—this in addition to the seventy-five Army and sixty Navy VLR aircraft currently allocated to the antisubmarine campaign.<sup>39</sup>

By this proposal General Marshall hoped to place the joint air force above questions of rival jurisdiction. By vesting the control of his proposed command in the JCS themselves, with COMINCH as their executive,<sup>40</sup> he left the way open for the appointment by the JCS of an immediate commander most suitable for the job. According to policy then in the process of formulation,<sup>41</sup> command of any joint force would be settled on the basis of the nature of the mission to be performed and the single commander would be designated by the Joint Chiefs of Staff. Now it did not take abnormal insight to see that in view of this policy a very strong argument could and would be made for an Army Air Forces officer as commander of the VLR aircraft on anti-submarine duty. For the moment, General Marshall was apparently willing to leave that point unstated, hoping that, as soon as the policy governing joint commands was approved, the problem would resolve itself.

Navy authorities no doubt arrived at this conclusion themselves, for action on General Marshall's proposal was deferred pending the receipt of a report being prepared by the Navy Department and bearing on the same issue.<sup>42</sup> On 1 May, Admiral King presented an alternative plan.<sup>43</sup> He proposed to set up at once in the Navy Department an anti-submarine command to be known as the Tenth Fleet and to have jurisdiction over "all existing antisubmarine activities of the U.S. Fleet." The commander of the Tenth Fleet would have direct command over all sea frontiers, using frontier commanders as task force commanders, and he would exercise control over all LR and VLR aircraft engaged in the work. In order to avoid duplication, initial training in Army anti-submarine aviation would be given by the AAFAC under guiding directives prepared by the commander of the Tenth Fleet. Maintenance of Army antisubmarine aviation would also appropriately remain a

\* A similar proposal made a fortnight earlier by Secretary Stimson had been vetoed by Secretary Knox and Admiral King as tactically unsound. (Ltr., Stimson to Knox, 1 April 1943; memo for JCS from OC/S, in JCS 268.)

function of the commanding general of the AAF. A logistical plan would be evolved to permit the greatest possible mobility on the part of the air units.

This proposed coordinating agency, this novel "fleet without a ship," provided only a partial answer to the problem. It vested responsibility for antisubmarine and related operations in a commander who did not have competing claims to his attention. That at least was a step in the right direction. But it did not in any way meet General Marshall's recommendations. It placed shore-based air power under the control of the Navy rather than of the Joint Chiefs of Staff; and it left the system of sea frontier commands as the basic machinery for the employment of the air arm. Indeed, to AAF observers, it seemed that the only real change involved in Admiral King's plan was that COMINCH would emerge with increased control over AAF antisubmarine forces and the right to use Army bases.<sup>44</sup> It also appeared that Admiral King envisaged the possible expansion of the Tenth Fleet's jurisdiction beyond the Atlantic to include the South and Southwest Pacific. This jurisdiction would actually involve the authority to allocate antisubmarine aircraft and vessels between Atlantic and Pacific areas, a prerogative hitherto resting strictly with the Joint Chiefs.<sup>45</sup>

Although the plan failed to meet his full approval, General Marshall was willing to compromise. He recognized that, according to the pending decision on command of joint forces (JCS 263/2/D, dated 20 April 1943) which would determine such matters on the basis of the nature of the mission to be performed, the Navy had prior interest in antisubmarine warfare in general. He was therefore willing to accept the Tenth Fleet even at the expense of removing antisubmarine operations from the province of the Joint Chiefs of Staff to that of the Navy Department. And since the air component would be a joint force it should be operated within the Tenth Fleet. But the same policy regarding joint forces would also govern the command of the joint land-based air force. Not only was the antisubmarine mission of special importance to the Army but the problems of bases, air transport, maintenance, and supply were all essentially Army problems. Moreover, with a majority of the VLR bombers actually employed against the submarines and with some 400 VLR bombers scheduled for this mission by the end of the year, the Army could claim a certain priority of interest in the problem of organization.\* General Marshall therefore requested that

\* See above, pp. 387-88, and below, pp. 392-93.



an Army air officer be given command of the VLR and LR aircraft engaged in antisubmarine warfare.<sup>46</sup> This proposal, touching as it did the very heart of the controversy, continued to be the subject of lively discussion. Meanwhile, on 19 May, Admiral King proclaimed the existence of the Tenth Fleet, operating under his direct command for the purpose of exercising unity of control over U.S. antisubmarine operations in that part of the Atlantic under U.S. strategic control.<sup>47</sup>

### *The AAF against the U-Boat*

While the organization of the antisubmarine campaign was being discussed at the higher levels, the AAFAC was busily engaged in gathering strength and using it to the best of its ability against the enemy. By the latter part of May the command was able to report 114 operational planes in the VLR and VLR (E) categories. Of these, 104 were radar-equipped, and of this number 72 were described as B-24 VLR (E). Only one squadron of the ten long-range units by that time in operation was equipped with B-17's. The rest of the twenty-five anti-submarine squadrons were equipped with B-25's and other medium bombardment types.<sup>48</sup> It was a source of some bitterness to the AAFAC personnel that only two of its long-range squadrons had as yet been given the opportunity to serve overseas.

Meanwhile, also, the Battle of the Atlantic had reached a crisis. The Allied invasion of North Africa and the increasingly effective convoys that shepherded American forces to the British Isles had thrown the German U-boat fleet on the strategic defensive. Admiral Doenitz, now in complete command of the German navy, recognized the critical importance of the North Atlantic convoy route and prepared during the fall and winter of 1942 to make a decisive counterattack in that area. His hope lay in the gap in mid-ocean, amounting to a few hundred miles, which lay beyond the reach of shore-based aircraft as they were then deployed. Toward this gap, early in 1943, he directed the bulk of the U-boat fleet currently operating in the Atlantic. As many as seventy to eighty submarines operated at one time in that area, organized in wolf-packs, a tactic which constituted the enemy's most effective countermeasure to the convoy system. Working systematically and in concert, these North Atlantic wolf-packs launched a desperate attack on Allied shipping; and so successful were they that shipping losses mounted to 750,000 tons during the first three weeks of March.<sup>49</sup>

The situation called for immediate action. In particular it called for

more VLR aircraft and additional aircraft carriers to operate over the middle portion of the convoy route. The critical nature of that route had been recognized long before the spring U-boat offensive of 1943. But by the middle of March the situation remained serious in the extreme. Only a handful of medium-range planes were being employed from Greenland and Iceland, and a squadron (the 20th) of AAFAC B-17's, although limited in their range as compared with the B-24, had for some time been flying long-range patrols from Newfoundland. The Navy had only one aircraft carrier in the area as yet. Although Army, Navy, and Canadian air bases were believed capable of supporting B-24's at the rate of seventy-five in Newfoundland, forty in Iceland, and six (for limited operation only) in Greenland, existing plans provided for no such numbers. For Newfoundland the AAF planned eighteen B-24's by 1 June, and the U.S. Navy hoped to have twelve in that area by the same date. The Navy did, however, expect to employ two additional escort carriers (CVE's) in April. Early in March the Atlantic Convoy Conference had proposed that the Army's antisubmarine command operate three squadrons of B-24's from Newfoundland. General Arnold was concerned to implement the proposal fully and as soon as possible.<sup>50</sup>

Finally, after months of negotiations, involving Army, Navy, British, and Canadian representatives,<sup>51</sup> a detachment of the 25th Antisubmarine Wing of the AAFAC left New York, under the command of Col. Howard Moore, to establish a headquarters at St. John's, Newfoundland. On 3 April this detachment began operations, using the control room of the combined Royal Canadian Air Force headquarters. The 19th Antisubmarine Squadron also arrived in March, and the 6th Antisubmarine Squadron a few weeks later. Both were stationed at Gander Lake with the 20th Squadron. Both became operational during April.<sup>52</sup> By that time the battle in the North Atlantic was already reaching its peak of intensity. All three squadrons saw brisk action during April, both on convoy missions and during offensive sweeps in the broad areas ahead of convoys. But after the concerted attack on a convoy known as ONS-5 (28 April to 5 May) in which the U-boats sank twelve Allied merchant vessels at a considerable cost to themselves, the Germans began to withdraw their forces from the North Atlantic.<sup>53</sup> During May the waters off Newfoundland provided ever poorer hunting for the antisubmarine aircraft. Late in June 1943, their services no longer required in Newfoundland, the three Army squad-

rons (the 4th had replaced the 20th early in that month) were ordered to England, where they were organized into the 479th Antisubmarine Group, still under the command of Colonel Moore.<sup>54</sup>

By June 1943 convoys were passing safely through lanes where a few weeks previously they had undergone the severest punishment. On 30 June, Prime Minister Churchill announced publicly that hardly a single Allied ship was sunk in the North Atlantic between 17 May and the end of June. To this spectacular victory the specially equipped VLR Liberators employed by the British, American, and Canadian air forces had contributed decisively. In March and April they had been reinforced by carrier aircraft from the new escort carriers. Despite the slowness with which the Allied force had become operational, its combined strength together with its microwave radar equipment again forced the enemy to change his tactics. Of assistance, to be sure, had been the increased scale of Allied operations in the Mediterranean.<sup>55</sup>

The withdrawal of the U-boats from the North Atlantic once more pointed to the strategic importance of the Bay of Biscay transit areas. There alone, the British felt, could the enemy be located with any degree of certainty after this change in his strategic plan. They accordingly urged the launching of an Allied offensive on an unprecedented scale in the bay and its approaches.<sup>56</sup> The AAF was reluctant to increase its commitment to the antisubmarine campaign since it was evident that any such increase would have to be made at the expense of the ETO heavy bombing operations. But by June it was also becoming clear that the AAFAC squadrons operating in Newfoundland could now be released for operations in the Bay of Biscay.<sup>57</sup> Support for this solution came from Admiral King, who had hitherto opposed the use of VLR aircraft in a purely offensive campaign.<sup>58</sup> In July the 479th Antisubmarine Group began its operations from the United Kingdom under the operational control of RAF Coastal Command.<sup>59</sup>

The British meanwhile had gone ahead with plans for a concentrated offensive in the Bay of Biscay. It was decided early in June to concentrate in the area all available aircraft not required for close escort of convoys, and to reinforce the air forces by surface support groups withdrawn from the convoy routes. The resulting joint striking force was deployed in two new areas in the bay. Reinforcement in the extreme southern waters came from the Allied forces at Gibraltar and the Moroccan Sea Frontier. This newly intensified offensive met with early success. The enemy attempted to counter it by sending the

U-boats through the bay in close groups of two, three, or more and by instructing them to fight back with antiaircraft fire when attacked. This policy of fighting back rather than submerging when attacked by patrol planes had been in use since the Germans began their desperate attempt in 1943 to regain the ascendancy which had been theirs in the fall of 1942. It undoubtedly made air attack more hazardous than it had been, but it did not prevent attacks; and, in fact, it presented a target which the steady-nerved aircrew knew how to exploit.<sup>60</sup>

This was the campaign in which the 479th Group became engaged in July. On the 13th it flew its first operational missions.<sup>61</sup> Not long afterward (29 July) Air Marshal Slessor spoke of the "most welcome reinforcement" provided by the group.<sup>62</sup> The 479th had, indeed, taken an extremely active part in that campaign. During the period from 13 July to 2 August, aircraft of the group sighted twelve submarines and attacked seven of them. Of those attacked, three are known to have been sunk, one with the aid of RAF aircraft. The missions of the 479th Group were for the most part executed in the face of determined countermeasures. The U-boats struck back with a degree of intensity that is believed to have caused the loss of one B-24. More serious was the opposition offered by enemy aircraft—and equally indicative of the desperate plight of the submarine fleet. The American flyers encountered the twin-engine Ju-88's throughout the period of operations, often in relatively large groups. The average number of enemy aircraft per encounter amounted to upwards of six. Considering the fact that the B-24's normally flew singly, it is surprising that no more than two were lost as a result of air engagements. Even so, of course, the strain on the crews was great. They were instructed to avoid air combat whenever possible, but in many instances the enemy pressed the attack too vigorously to be avoided.<sup>63</sup>

In July, 26 per cent of all attacks made on U-boats were made in the bay, and the B-24's of AAFAC operating in that area had to fly an average of only fifty-four hours per sighting. The situation altered radically in August. Only seven damaging or destructive attacks were made in that month, as compared to twenty-nine for July. Sightings fell off proportionately. The 479th Antisubmarine Group spent most of its time in August combating enemy aircraft rather than in attacking U-boats. Yet throughout the month of August, plotting boards regularly carried from ten to twenty U-boats in the area, which was approximately the same concentration as characterized the previous month.

Nor can the lack of sightings be charged to any relaxation of the offensive effort. The failure to sight the enemy in August may be explained in part as the result of the installation of radar by the Germans in their submarines. Increasingly, the aircraft on antisubmarine patrol found that the "blips" disappeared from their radar screens at average distances of eight or nine miles, indicating that the enemy was detecting patrol aircraft at safe distances. The Germans also altered their tactics considerably in order to cut down the heavy losses sustained by them in July. They abandoned the disastrous practice of remaining surfaced and fighting back during air attacks and resorted again to an over-all policy of evasion, hugging the Spanish coast line so as to confuse radar contact and surfacing only at night in that farthest-south part of the bay which lay at the extreme limit of the English Wellingtons equipped with Leigh-lights for night flying.<sup>64</sup>

Nevertheless, it must be remembered that the tactics to which the Germans resorted—fighting back in July, hugging the Spanish coast in August, and using extremely heavy air cover in both months—are themselves eloquent evidence of the effectiveness of the bay offensive. Moreover, the effect of antisubmarine activity cannot be determined entirely by the amount of damage directly inflicted on the enemy. The constant patrolling of the bay forced the submarines to proceed so slowly through the transit area that their efficiency in the open sea was greatly reduced and the morale of their crews seriously impaired. Yet even in terms of submarines sunk, the bay campaign inflicted heavy loss on the enemy. During the thirty-day period from 3 July to 2 August all Allied antisubmarine forces sank sixteen U-boats in the Bay of Biscay and its approaches, or over 39 per cent of all Axis submarines sunk by Allied effort during that period. Of these sixteen, all but one were accounted for by aircraft. Of these successful air attacks three are credited to the B-24's of the 479th Antisubmarine Group. The rest were the result of British action.<sup>65</sup>

Closely related to the Bay of Biscay offensive was the action in the Moroccan Sea Frontier. In fact, the two at times overlapped, aircraft from the latter reinforcing the campaign in the transit area, at least in its most southerly reaches. In any event, the antisubmarine warfare in the approaches to the Strait of Gibraltar was always likely to be affected by strategy in the Bay of Biscay, probably even more than other Atlantic areas, all of which were affected in one way or another. As the summer bay offensive reached its climax in late June and early

July, outbound U-boats tended more and more to skirt the Spanish coast to Cape Finisterre and from there to deploy in a southwesterly direction toward the waters between the Azores and the coast of Portugal. The result was a concentration, during the first two weeks of July, of enemy submarines in that area.<sup>66</sup> The object of this maneuver, in addition to avoiding patrolling forces in the bay, was apparently to create a screen off the coast of Portugal to intercept supplies and reinforcements for the Allied campaign then being developed in the Mediterranean. It was a bold move for it brought the U-boats within range of antisubmarine aircraft operating from Northwest Africa and Gibraltar, and it coincided with the brief and desperate attempt of the submarines in the bay to counter the air offensive by antiaircraft fire. The enemy also relied on the relative ease with which air protection could be provided in the form of Ju-88's and the longer-range FW-200's.<sup>67</sup>

It was in these waters that the 480th Group became engaged during the month of July 1943 in a brief but very effective campaign. After arriving at Port Lyautey in March 1943, where it flew under the operational control of the Moroccan Sea Frontier, it found in the approaches to Gibraltar a field well suited to its capabilities.<sup>68</sup> Since the Allied invasion of Africa in November 1942, the German submarine fleet had made every effort to harry Allied convoys heading for Northwest Africa. At first they had met with some success. Soon, however, Allied aircraft made hunting near Casablanca too costly for the U-boats to continue, and they were forced to retire to positions 400 miles or more from the strategic shore area. After January 1943 all merchant vessel sinkings occurred more than 600 miles from the nearest aircraft base. From January until March the U-boats stayed beyond the range of the medium-range, land-based aircraft then available to the Allies. Although the latter flew thousands of hours, they made few if any sightings. Shortly after the arrival of the Army B-24's in March several sightings were made by those long-range planes, mostly in the outer waters beyond the normal coverage provided by the U.S. Navy's two PBY squadrons.

Thus it became the special task of the 480th Group to carry on long-distance patrols, making maximum use of its SCR-517 radar equipment. Normally it sent out three planes a day on patrol missions extending west and north often to the prudent limit of endurance which was set in the neighborhood of 1,050 nautical miles. During the months of its stay at Port Lyautey the 480th Group made roughly ten times as many



sightings per hour of flying time as the Navy PBY's operating from the same bases at the same time. This record resulted in large part from the extra range possessed by the B-24's. But it also stemmed in part from the superior efficiency of their radar equipment which accounted for over half the sightings made. Moreover, upwards of 90 per cent of these sightings were made within eighty miles of a submarine position, as plotted by the local control room; and no unthreatened convoy (defined as one having no plotted U-boats within 100 miles, or within 100 miles of its course for the ensuing twenty-four hours) was attacked. Both these facts, the AAFAC believed, vindicated its preference for a systematic program of independent search and attack as against the use of B-24's for the essentially defensive work of convoy coverage.<sup>69</sup> At first Colonel Roberts of the 480th Group had been seriously concerned lest the Navy's emphasis on convoy should vitiate the usefulness of his VLR striking force. However, rather by informal agreement with understanding naval commands than according to official Navy direction, the group was given increasingly substantial freedom in planning its missions.<sup>70</sup>

So it was, then, that the 480th Group was able, by virtue of its training, equipment, and tactical doctrine, to take an effective part in the antisubmarine campaign of early July. Flying sometimes as far north as Cape Finisterre, its B-24's supplemented the antisubmarine campaign then at its peak in the Bay of Biscay. During the ten days from the 5th to the 15th of July they made fifteen sightings and thirteen attacks which resulted in the destruction of three submarines and in damage to several more. In a number of instances the U-boats fought back as they were currently in the habit of doing in the bay. After this decisive, if local, defeat in the waters off Portugal, they abandoned their policy of active defense and resorted once more to diving whenever they became aware of an approaching aircraft, which in part accounts for the lack of sightings made by the 480th Group during the remainder of the summer.<sup>71</sup>

It was also after this brisk offensive that the Germans began to patrol the area with heavily armed multiengine planes. As in the bay campaign it was this resistance in the air that proved more disturbing to the anti-submarine aircraft than that from the U-boats themselves. Here, however, it was not alone the relatively short-range Ju-88 that opposed the Americans but the powerful, four-engine FW-200 which, in many ways, was comparable to the B-24 itself. These big planes began to

appear in August, and from that point on the crews of the 480th Group found their missions to be increasingly hazardous. On 17 August one B-24 encountered two of the German FW-200's and there ensued at minimum altitude a fantastic dogfight between the giants, in the course of which the Liberator had two of its engines knocked out and its wing set afire. Before ditching, however, its crew was able to shoot down one of the enemy and to damage the other so badly that it very probably failed to regain its base. Seven of the American crew survived and were rescued. In combat with the FW-200's the 480th lost, in all, three of its planes and accounted for five of the enemy.<sup>72</sup>

Antisubmarine action in the Moroccan Sea Frontier, to which the 480th Group contributed probably more than any other unit present, proved of decisive importance in protecting the logistical life lines of the Allied campaign in Sicily. In July, when Allied convoys were sailing toward Gibraltar, they were able to pass through waters heavily patrolled by U-boats practically without loss from submarine activity.<sup>73</sup> This result was a triumph for the air arm, as employed both in convoy escort and offensive sweeps, and it vindicated the principles underlying both methods.

Operations in the eastern Atlantic gave the AAFAC a chance to test its strategic and tactical doctrine in an area where operations had to be carried out against an ever-present and often dangerous enemy. They taught the Army crews many things—the use of cloud cover as a means of surprising the U-boat crew, for example, and the effective use of radar. A dramatic example of the use of radar occurred during the July offensive. A B-24 of the 1st Antisubmarine Squadron, patrolling about 200 miles northwest of Lisbon and flying at 5,600 feet over solid clouds, picked up a radar contact about thirteen miles dead astern. The pilot turned and descended through the overcast on instruments at 240 miles per hour, constantly receiving headings from the radar operator. The B-24 finally broke through at 200 feet and its crew sighted a surfaced U-boat on the starboard bow, only one mile away. The attack, executed immediately, resulted in the swift and certain destruction of the submarine.<sup>74</sup> As a result of these operations in the eastern Atlantic, the AAFAC was able to say with some assurance that the offensive strategy had worked. If not the be-all and end-all of antisubmarine activity, it had at least to be considered an essential element.

In contrast to the intensive, if sporadic, activity of the squadrons operating from Newfoundland, the United Kingdom, and the Moroc-

can Sea Frontier, the story of those which remained within the continental United States (a majority of the units assigned to the AAFAC) is one of endless patrols, few sightings, and still fewer attacks. While units of the 479th and 480th Groups were enjoying brisk hunting, flying at times considerably less than 100 hours per contact, squadrons operating in the Eastern and Gulf sea frontiers had to fly many thousands of hours for a single sighting. For in those waters almost no enemy activity had been encountered since September 1942. Nor was the hunting in the Caribbean much better. Since the winter of 1942-43, two squadrons had normally been stationed there, one in Cuba and one at Trinidad. Yet their arrival coincided roughly with that shift of German strategy which drew the U-boat fleet away from the U.S. strategic area in an effort to cut off the invasion convoys. Although a few nuisance raiders remained, especially in the Trinidad area, neither submarine nor antisubmarine activity was at all brisk even in that one-time happy hunting ground for the U-boat fleet.<sup>75</sup>

The Navy, however, felt obliged to patrol not only the more or less threatened shipping lanes in the Caribbean but the relatively safe waters of the Eastern and Gulf sea frontiers with as many aircraft as might be spared from more urgent projects. The enemy, it was argued and with some justification, had withdrawn, but he might return. He was not too preoccupied to overlook a rich and unprotected merchant shipping lane. Accordingly, an "irreducible minimum" of aircraft would, COMINCH felt, have to be maintained in the U.S. coastal waters despite the meager returns obtained.<sup>76</sup> This position was generally appreciated. The only question was how small that minimum had to be before it became truly irreducible. Was it necessary to provide such heavy air coverage in the Eastern and Gulf sea frontiers—in July 1943 amounting to fifteen out of twenty-five AAFAC squadrons? Was it an economical way of using units specially trained in the work of destroying submarines to deploy them in areas where there were few if any submarines to destroy?

These were debatable questions, the debate (prior to July 1943 at any rate) resolving itself usually into a conflict between the AAFAC ideal of a mobile offensive force and the Navy's doctrine of the relatively fixed defense. The result was that many of the fully trained and equipped antisubmarine crews could say of their operations as one squadron historian said, somewhat wistfully, of his entire squadron: "The tactical achievement of the squadron cannot be elaborated on by

enumerating the number of submarines sunk. It has been our misfortune never to have had the opportunity of sighting a submarine." When he added sturdily that "this fact has never reduced the crews' efficiency and patrol missions have been conducted in an alert manner," he epitomized the combat story of most of these units.<sup>77</sup>

If this were the whole story of operations in the Eastern and Gulf sea frontiers, it would be a disproportionately slight one in view of the number of squadrons involved. Happily the story is much larger, for it includes also a prodigious program of technical development and crew training. When the AAFAC was activated, a beginning only had been made in the task of securing the proper weapons and auxiliary devices for antisubmarine warfare and of training personnel in their use. Gradually B-24's replaced the medium-range aircraft originally employed by the command, and crews were given transitional training in the operational training unit at Langley Field. By August it was possible to report seventy-five B-24's among nine of the squadrons based in the continental United States. Much of the responsibility for training fell also on these home units, because the need for operational planes made it necessary to carry on training to a considerable extent in conjunction with patrol operations—which, of course, did not in these areas involve unduly hazardous flying. Training thus became the principal function of the domestic squadrons.<sup>78</sup>

Research in antisubmarine devices and techniques within the AAF had been made the special responsibility of the Sea-Search Attack Development Unit (SADU) operating at Langley Field under the direct control of Headquarters, AAF.\* This unit maintained liaison with the other agencies similarly engaged—the Antisubmarine Warfare Operations Research Group and the Navy research unit known as the Air Antisubmarine Development Detachment, Atlantic Fleet. The AAFAC itself found it necessary, however, to insure through its research coordinator that the program of technical development was as nearly as possible in accord with the experience and the requirements of its own operating units. Radar naturally received a major share of the research effort, and the AAF units as a result were able greatly to extend the efficiency of their operations. Other devices were being developed by all the research agencies—the magnetic airborne detector and the radio sonic buoy to supplement radar in detecting submerged craft, the retro-bombing devices and forward-firing rocket equipment

\* See Vol. I, 550-51.

to improve the effectiveness of the air attack—but they had barely emerged from the experimental stage when the AAFAC went out of business in August 1943.<sup>79</sup>

### *Dissolution of AAFAC*

During the summer of 1943, while the AAFAC was developing into a powerful and unique striking force, the debate over the organization of the American antisubmarine forces was entering a new and climactic phase. The Tenth Fleet, though a step in the right direction, failed to solve the problem of organization. The situation remained in a state of extremely unstable equilibrium. In fact, it may be that by the latter part of May 1943 a compromise settlement of the antisubmarine question was no longer possible. By that time, an issue much larger than that of the land-based antisubmarine air force and its control had been raised, and a solution of the lesser problem had to wait until the larger, of which it constituted a part, could be satisfactorily settled. In other words, control of land-based antisubmarine aircraft raised the question of the control of all land-based, long-range aircraft employed on over-water missions.

The Navy had steadfastly resisted the notion that land-based aviation constituted a virtually separate arm which no longer fitted into the traditional pattern of the two primary services. In a perfectly natural effort to make its forces self-contained and to be as free as possible from the cramping necessity of coordinating with forces of another service over which it could exercise only a shared authority, the Navy had striven to build up an air force of its own. This effort became especially vigorous when the long-range and very long-range land-based bombing planes demonstrated their pre-eminence in long-distance patrol. The Navy had quickly recognized the value of the B-24 and secured considerable allocations of that type.\* According to the Bureau of Aeronautics, this program for an increase in land-based aircraft arose in part from a shift of emphasis from seaplanes to long- and medium-range land planes both for antisubmarine operations in the Atlantic and sea search, reconnaissance, and patrol work in the Pacific.<sup>80</sup> And Admiral King had intimated that he hoped his system of unified anti-submarine command might be extended to include operations in the Pacific.<sup>81</sup>

To keep all of the elements necessary to its operations under its

\* See above, p. 388.

direct control was an understandable policy on the part of a service which had traditionally maintained a purity of organization quite impossible in the Army. As General Marshall pointed out in a letter to the admiral, the problem of control of long-range aircraft operating with the Navy on antisubmarine patrol bore a marked similarity to the Army problem of divisional organization. A divisional commander knows that he can handle the artillery and engineers more efficiently if they are all organic parts of the division and do not include elements attached only for a particular operation. But without forces almost unlimited in numbers, such a policy would result in a duplication which, however efficient for the particular project, would be ruinously wasteful to the war effort as a whole. This was a problem which the Army had been forced to face since 1917; except for the creation of virtually a second army in the Marine Corps, the problem had not presented itself to the Navy until the question of air striking forces had arisen. The trend, Marshall felt, if carried to its logical conclusion, would mean the eventual consolidation of the Army and Navy, for it would remove the essential distinction between them.<sup>82</sup>

It is clear that the Navy had no such consolidation in mind. But for some time, in fact since the first allocation of B-24 aircraft to the Navy, Army observers had been concerned about the Navy's plans for utilizing these aircraft; and the problem of duplication had remained inherent in all antisubmarine planning since the creation in October 1942 of an Army antisubmarine command. Now, in the summer of 1943, it began to appear to Army observers that the Navy intended not only to build up a large force of long-range, land-based bombers for patrol purposes and convoy cover but was prepared as well to employ them in an offensive along lines already being pursued by the RAF and the AAFAC. This, if true, would bring the question of duplication clearly into the open. And indications there were which pointed in that direction. In April 1943, Admiral Leahy had stated in a joint conference that the only reason for the delay in offensive action by the Navy had been lack of adequate forces. In May the Navy's antisubmarine aircraft carriers had been a decisive factor in the defeat of the U-boat in the North Atlantic. When that Allied victory reduced the need for convoy cover off Newfoundland, Admiral King, who at the Atlantic Convoy Conference in March of that year had set himself positively against a Navy offensive for the rest of the calendar year, seemed inclined to reconsider his position and to urge the reinforcement of the Bay of Biscay



campaign with as many VLR planes as could be spared over and above that "irreducible minimum" he felt obliged to keep in the western Atlantic.<sup>83</sup>

Whether or not the situation warranted it, the fact remains that Army observers regarded Navy plans relative to land-based aircraft with some suspicion. It appeared that the Navy was intent either on duplicating the function of the AAFAC within its own organization by the increased allocation of B-24's to be deployed on offensive operations, which would be patently wasteful, or on securing complete control of all antisubmarine aircraft, including the VLR planes of the AAFAC, which would merely remove the danger of duplication to a much higher level. The destiny of the AAFAC as a long-range air striking force thus became inextricably tied up with the question of land-based air striking forces in general, a question which all but involved the separate existence of the Army Air Forces itself.

So it was that the situation even after the establishment of the Tenth Fleet remained extremely acute. Indeed, it rapidly deteriorated. For the issues were now clearer, and it had become evident that control of the long-range antisubmarine air force could be disposed of in two ways only: it could be given to the Army Air Forces, with or without the over-all operational supervision of the Navy, or it could be given completely to the naval authority. The AAFAC, acting merely as the AAF's contribution to the total antisubmarine air force, no longer occupied a tenable position. Logically speaking, there was plenty of middle ground. If, as General Larson suggested (making use of concepts then taking shape within the AAF), the AAFAC were considered the "strategic" antisubmarine air force and deployed exclusively as a long-range, mobile striking force, then the Navy air arm engaged in antisubmarine patrol could be left the job of close support of the fleet in the peculiarly naval mission of protecting shipping and thus become the "tactical" antisubmarine air force—a division of command into two independent organizations, based on a natural division of function.<sup>84</sup> But the force of circumstances continued greatly to outweigh the force of logic, and General Larson's conception of his antisubmarine command and its place in the military scheme bore little relation to the larger conflict of interests in which that organization had become involved.

Meanwhile, discussion continued regarding the command arrangements for the VLR and LR aircraft engaged in antisubmarine warfare.

Both General Marshall and General Arnold were willing to recognize that, according to the principle of unity of command in joint operations,<sup>85</sup> the Tenth Fleet should exercise jurisdiction over all antisubmarine forces, including the air arm. But they were convinced that the VLR and LR air units should operate also as a joint force under a single air commander who, according to the same principle, should be an Army air officer, for this air component would be predominantly Army in its make-up. They nominated for the position Maj. Gen. Willis H. Hale, then air chief in Hawaii and considered to be familiar with overwater operations and naval procedures.<sup>86</sup> This officer would be stationed at Headquarters, Tenth Fleet, and would have charge of all Army and Navy shore-based aircraft, except such short-range types as were assigned to frontiers for inshore work. He would have under him in each sea frontier an air commander, either an Army or Navy officer according to the predominant interest in the local situation. The sea frontier commander would assign missions to the air commander under him, but the air commander would be left full discretion as to how the mission should be carried out with the aircraft available. For such tactical and technical matters he would be responsible to the overall air commander, General Hale.<sup>87</sup>

Admiral King objected vigorously to this Army plan on two grounds: first, it would place all VLR and LR aviation under an Army officer and, second, it would shift responsibility for tactical and technical employment of such land-based aircraft from naval officers "who had become familiar with the problem by experience" to an Army air commander who "might be expected to modify all that the Navy has so far done in organizing, developing, and training its air forces for anti-submarine warfare." Any such scheme, he declared, involved disunity between air and surface forces, whereas "all experience points to the need for the closest coordination between them." "I recognize," he added, "that the Army Air concept of command differs from the naval idea of close integration of aviation with other arms throughout all echelons."<sup>88</sup>

In short, Admiral King would not accept a joint air command operating under his unified command, nor would he intrust the operation of naval air units to any air commander, Army or Navy.<sup>89</sup> General Marshall, to whom it was a matter of secondary importance whether the unified air command be under a Navy or Army officer, felt the crux of the matter lay in the definition of unified command over joint forces.

According to JCS 263/2/D, "Normally in operations, this will consist of the assignment of their respective missions. In carrying out its mission the tactics and technique of the force concerned are the responsibility of that force." It was essentially the old problem of operational control restated: granted that the Navy should exercise such control over antisubmarine air operations, should it be, as in the case of the Admiralty's control over the RAF Coastal Command, a jurisdiction principally concerned with the mission to be performed, or should it involve direct control over the tactics and techniques to be employed by the air arm in the performance of that mission? In order to clear up the situation Marshall was prepared, if necessary, to take the matter to the President.<sup>90</sup>

Pending a final settlement with regard to the control of all air units engaged in antisubmarine warfare, there arose a grave danger that the air campaign itself might suffer. Fortunately, by June, the situation in the North Atlantic no longer threatened the very life of the American forces in the European theater. But the situation in the Mediterranean depended on the still doubtful ability of ocean convoys to reach African and Mediterranean ports. It was to make safe the passage of these convoys that the Navy urged participation in the British offensive in the Bay of Biscay. The War Department, although well aware of the value of offensive action in this key area, was still reluctant to commit U.S. air units to the project until the question of their control could finally be settled. The project was given War Department and AAF indorsement before any serious delay was experienced. But the fact remained that the AAFAC and those agencies having to do with its mission were handicapped by the impossibility of reconciling long-term obligations with an immediately precarious status which necessitated planning on a short-term, emergency basis.<sup>91</sup>

Final deliberations had already begun. On 10 June 1943, Rear Adm. John S. McCain met with General Arnold and Lt. Gen. Joseph T. McNarney to draw up an agreement which would settle the question once and for all. The resulting agreement followed substantially these lines: (1) The Army was prepared to withdraw the AAF from anti-submarine operations at such a time as the Navy would be ready to take over those duties completely. (2) Army antisubmarine aircraft would continue to operate as long as the Navy had need for them. (3) Army antisubmarine B-24's would be turned over to the Navy in such numbers as could be replaced by Navy combat B-24's. (4) The fleet air

wings which the Navy proposed to station along the Atlantic and Pacific coasts would comprise only those types of aircraft whose primary functions were those of offshore patrol and reconnaissance and the protection of shipping. (5) It was primarily the responsibility of the Army to provide long-range bombing forces (termed "strategic air forces") for operations from shore bases in defense of the Western Hemisphere and for "appropriate operations" in other theaters. (6) Long-range patrol planes assigned to fleet air wings were to be used for the primary purpose of conducting offshore patrol and reconnaissance and the protection of shipping, thus relieving Army long-range bombing forces from such duties. (7) Nothing in the above provisions were to be so interpreted as to limit or restrict a commander in the field, whether Army or Navy, in his use of all available aircraft as weapons of opportunity or necessity.<sup>92</sup>

In effect this Arnold-McNarney-McCain agreement constituted a radical division of responsibility in the employment of long-range aircraft. In return for unquestioned control of all forces employed in reconnaissance, offshore patrol, and for the protection of shipping, the Navy agreed to relinquish all claims to control of long-range striking forces operating from shore bases. The control of these "strategic air forces" would thus remain unequivocally an Army Air Forces responsibility. Although conceived in the spirit of earlier agreements and in a sense merely a restatement of an old principle, this agreement had far-reaching implications. The problem of strategic striking forces, if not essentially different from prewar days, had, especially with the promise that the B-29 would soon be ready, developed proportions and ramifications which no doubt required redefinition.

It was one thing to reach an agreement in committee, however, and quite another to secure its approval. Neither Secretary Stimson nor Admiral King was willing to give up without a struggle. Admiral King accepted with alacrity the proposal that the Army hand over its anti-submarine responsibilities to the Navy. It was, he said, a solution he was himself preparing to propose.<sup>93</sup> But he gave no indication of turning over to the Army the *quid pro quo* by which the concession was to be obtained, preferring to leave undefined as a matter not germane to the antisubmarine issue the Army's right to conduct other long-range striking operations by land-based planes.<sup>94</sup> To Secretary Stimson this failure of Admiral King to indorse both halves of the Arnold-McNarney-McCain agreement promised only to perpetuate trouble between Army

and Navy. Furthermore, he was by no means convinced that the agreement itself augured any improvement in the war effort. He granted the wisdom of clarifying the over-all jurisdiction, provided the result was clear enough to eliminate friction between Army and Navy. But he seriously doubted if the antisubmarine campaign would profit by the elimination of an AAF organization staffed by young, air-minded men who were trained in the use of long-range bombers and who possessed the initiative and inventiveness necessary to develop antisubmarine offensive measures to the utmost. The AAFAC had, he felt, embarked on a policy entirely foreign to anything the Navy hitherto had proposed. It still possessed the equipment, personnel, and doctrine uniquely adapted to the purpose of destroying the submarines at sea.<sup>95</sup>

Faced with the threat of a continued impasse in a matter so close to the heart of the war effort, General Marshall opened his mind with extreme frankness to Admiral King in a memorandum dated 28 June 1943:

The question of responsibility for offensive operations against submarines and that of responsibility for long-range air striking forces are so closely related that a proper solution of one, in my opinion, involves consideration of the other. The tentative Arnold-McNarney-McCain agreement appeared to offer an acceptable solution to both of these issues and solely on that basis I stated to you in my memorandum of June 15 that your proposal to take over anti-submarine air operations appeared to offer a practical solution to a vexing problem which has adversely affected the efficiency of our aerial war effort.

I should state here that in all of these Army and Navy air discussions I have tried very carefully to hold myself to a position from which I could consider the problems from a somewhat detached and, I hope, purely logical basis. As I remarked in the meeting of the Joint Chiefs of Staff the other day I feel that the present state of procedure between the Army and Navy is neither economical nor highly efficient and would inevitably meet with public condemnation were all the facts known. I have been hopeful that during the actual war effort we could manage our business in such a manner as to be spared the destructive effects of reorganizational procedure. But I am becoming more and more convinced that we must put our own house in order, and quickly, in order to justify our obligation to the country. I feel this very strongly because it is plain to me, however it may appear to others, that our present procedure is not at all what it should be.<sup>96</sup>

Accordingly, he reiterated his opinion that the Arnold-McNarney-McCain agreement promised the earliest and most satisfactory solution for the problem.

On 9 July 1943, approximately one month after the Arnold-McNarney-McCain committee convened, its agreement was accepted by both War and Navy departments. A schedule was subsequently

established whereby seventy-seven Army antisubmarine-equipped B-24's would be transferred with related equipment to the Navy, in return for an equal number of combat-equipped B-24's from Navy allocations. The transfer was to take place gradually from the latter part of July to the end of September.<sup>97</sup> Some difficulty arose over the relief of the squadrons on duty in the United Kingdom and in North-west Africa. Finally it was decided to keep them in their current duty status until such time as they could be relieved by similarly equipped Navy squadrons.<sup>98</sup> On 6 October 1943, AAF Headquarters was able to report that the seventy-seven planes in the original Army-Navy agreement had been transferred. In October, too, the Navy Liberators arrived at Dunkeswell, Devonshire, to relieve the 479th Group. By the middle of November, the 480th Group had been relieved and was on its way back to the United States.<sup>99</sup>

The AAFAC officially passed out of the picture before the complicated mechanism of transfer could be completed. By an order dated 31 August from Headquarters, Eastern Defense Command and First Air Force, its headquarters was redesignated Headquarters, I Bomber Command and assigned once more to the First Air Force, effective 24 August 1943.<sup>100</sup> The 25th and 26th Wings were inactivated and their personnel, together with all excess personnel left over from the earlier expansion made necessary by the increase in antisubmarine activity, were made available to AC/AS, Personnel for reassignment. The domestic squadrons, at that date numbering seventeen of the twenty-five separate squadrons of the command, were redesignated as heavy bombardment units and assigned to the Second Air Force. The 18th Squadron, which had operated as an OTU at Langley Field, was assigned to the 1st Sea-Search Attack Group of the First Air Force for the purpose of conducting replacement crew training on radar equipment. The 23d Squadron continued temporarily to serve as a special task unit on special duty with the Navy in the Caribbean for the purpose of experimenting with 75-mm. armament in B-25 aircraft, after which it went, with the bulk of the other squadrons, to the Second Air Force. The 479th Group, by that time consisting of four squadrons stationed in the United Kingdom, was inactivated and its personnel and equipment (the latter not a part of the seventy-seven-plane agreement) assigned to the Eighth Air Force, its personnel to be used as a nucleus in forming a pathfinder group. Similarly, the 480th Group returned intact to the United States, whereupon the bulk of its personnel was



assigned to the Second Air Force, a few of the officers remaining on duty with Headquarters, AAF. Its aircraft were made available for use in the American and Pacific theaters.<sup>101</sup>

As this slow process neared completion and the Army Air Forces prepared to bow finally from the stage of antisubmarine operations, the work of its deceased antisubmarine command became the subject of numerous laudatory statements, in which Admirals King and Andrews joined with General Arnold and others who were in like position to know whereof they spoke in pronouncing it a job well done.<sup>102</sup>

The story of the Army Air Forces Antisubmarine Command is one of great promise only partially fulfilled. It is a study in anticlimax. As a result of administrative confusion and imperfect planning the AAF found itself hunting submarines with land-based striking forces and sharing in the function, generally conceded to be a naval one, of protecting shipping. Into this work the personnel of its antisubmarine command put the energy and ingenuity of an organization manned by young, air-minded men and geared to the requirements of offensive warfare. But just as this organization was nearing the peak of its development in training and equipment it was dissolved—and through no fault of its own. For, if there is one fact that stands out above another in this study, it is that the fate of the AAFAC depended not at all on its doctrine of antisubmarine warfare or its ability to meet the demands of its mission.

Events have demonstrated the validity of its doctrine of the air offensive against the U-boat at sea. Of its operational record the command had reason to be proud. Although it had not been permitted to engage as fully as it would have liked in offensive operations against the U-boat, it had nevertheless contributed its share to the defeat of the enemy in 1943, a defeat from which the submarine fleet never really recovered. Four of its specially equipped B-24 squadrons which were allowed to hunt for limited periods in submarine-infested waters accounted alone for eight U-boats sunk (one destroyed in cooperation with the RAF). Of its potential ability, moreover, the command had reason to be confident. Only a fraction of its strength in trained B-24 units had, by August of 1943, seen action. And the new devices and techniques which it had helped develop were, with the exception of the microwave radar equipment, only beginning to emerge from the experimental stage by that date.

The same, of course, could be said of the entire American antisub-

marine effort. The U-boat had suffered its great initial defeat before either the U.S. Navy or the AAFAC had been able to bring to bear on the battle the special air weapons their research agencies were in the process of developing. Indeed, it was only in the spring and summer of 1943, when the Battle of the Atlantic had already reached its decisive phase, that the existing antisubmarine air weapons were used to anything like their destructive capacity. Then only were the Navy's carrier-based planes<sup>203</sup> (probably the most deadly single weapon) and the long-range, land-based bombers of both services (second only to the CVE as a submarine killer) thrown aggressively into the fight. Then only did the Navy adopt an offensive strategy involving carrier aircraft, land-based bombers, and surface forces. Perhaps no such offensive was possible at an earlier date when the task of protecting convoys may have outweighed in immediate importance that of destroying the submarine itself. Perhaps, also, the submarine enemy might have been defeated at an earlier date had the American antisubmarine effort been less subject to jurisdictional conflicts which prevented the most effective and economical use of all available forces.

Be that as it may, it was on a question of jurisdiction—the control of long-range air striking forces—that the fate of the AAFAC was decided. In relation to this more comprehensive problem, that of the AAFAC and its control constituted little more than a test case. But the importance of a test case is determined by the importance of the issue being tested, and thus the case of the AAFAC becomes one of the most significant to have arisen in the history of American military policy during World War II.



# SECTION III

\* \* \* \* \*

*SICILY AND SOUTHERN ITALY*



## CHAPTER 13

\* \* \* \* \*

### *PANTELLERIA*

IF THE Casablanca conference of January 1943 had cleared the way for full American participation in a heavy bomber offensive from the United Kingdom, it also had committed substantial air, ground, and sea forces to the conquest of Sicily (HUSKY) as an operation to be undertaken immediately after the end of German resistance in Tunisia.<sup>1</sup> The question of what would be done after HUSKY to exploit further the anticipated victory in North Africa was left for later decision.<sup>2</sup> But with the conquest of Tunisia yet to be completed and the Sicilian invasion scheduled for early in July, it was evident through the early months of 1943 that for the larger part of the year operations in the Mediterranean would continue to impose heavy claims on AAF resources.

Soon after the Casablanca decision to mount HUSKY, General Eisenhower, in accordance with a directive from the CCS, set up Force 141 as a planning staff. For more than two months the planners wrestled with the tough problem of choosing either a widely scattered series of landings designed to seize both the important port of Palermo on the northern coast and the no less important airfields of southern and southeastern Sicily or a more concentrated set of landings intended initially for capture of the eastern airfields and the neighboring port of Catania.<sup>3</sup> Generals Eisenhower and Alexander finally concluded that an attempt with limited resources to achieve too much in too many places involved the risk of "losing all everywhere,"<sup>4</sup> and so on 3 May 1943 they decided to concentrate their triphibious assault on the southeastern area, whose airfields were considered to be the key to a successful invasion of the island. The CCS, meeting at the TRIDENT conference, approved the plan on 13 May.<sup>5</sup> On that same day the last



Germans in Tunisia surrendered, and Allied headquarters moved immediately into the final preparations for HUSKY.

For the ground forces the end of the battle in Tunisia brought some respite. Air force units whose function was direct support of ground combat also found opportunity for rest, reorganization, and training. Other elements of the air forces experienced no letup but moved directly into large-scale operations preliminary to the conquest of Sicily.

The organization of the Allied air arm in the Mediterranean area had taken shape during the preceding winter\* and would remain virtually unchanged until after the invasion of Italy in September. At the top of the structure stood the Mediterranean Air Command (MAC), a small policy-making and planning headquarters headed by Air Chief Marshal Sir Arthur Tedder. Subordinate to it were the Northwest African Air Forces (NAAF), the RAF, Middle East (RAFME) with the Ninth Air Force assigned to it, and RAF, Malta. By far the largest of these subordinate commands was NAAF, commanded by Lt. Gen. Carl Spaatz and comprising the Northwest African Strategic Air Force (NASAF) under Maj. Gen. James H. Doolittle, the Northwest African Tactical Air Force (NATAF) under Air Vice Marshal Sir Arthur Coningham, the Northwest African Coastal Air Force (NACAF) under Air Vice Marshal Hugh P. Lloyd, the Northwest African Air Service Command (NAASC) under Maj. Gen. Delmar H. Dunton, the Northwest African Training Command (NATC) under Brig. Gen. John K. Cannon, the Northwest African Troop Carrier Command (NATCC) under Brig. Gen. Paul L. Williams, and the Northwest African Photographic Reconnaissance Wing (NAPRW) under Col. Elliott Roosevelt. Although the Twelfth Air Force, strictly speaking, now had no legal existence,<sup>†</sup> it actually served as the administrative organization for American elements of NAAF.

NAAF had carried, and would continue to carry, the main burden of operations. Its missions, flown from bases located in or just west of recently occupied Tunisia, were closely coordinated with those of Maj. Gen. Lewis H. Brereton's Ninth Air Force. The fighter units of the latter force (57th, 79th, and 324th Groups) had been transferred to the operational control of NATAF; similarly the 12th and 340th Bombardment Groups (M) had been attached to NATAF and the 316th Troop Carrier Group now flew its missions with NATCC. There were advantages, however, in continuing to operate the Ninth's

\* See above, pp. 161-65.

† See above, p. 167.

# **PRINCIPAL UNITS OF NORTHWEST AFRICAN AIR FORCES**

**1 June 1943**

## **Strategic Air Force**

U.S. 2d, 97th, 99th, 301st Bomb Groups (B-17's)  
U.S. 310th, 321st Bomb Groups (B-25's)  
U.S. 17th, 319th, 320th Bomb Groups (B-26's)  
U.S. 1st, 14th, 82d Fighter Groups (P-38's)  
U.S. 325th Fighter Group (P-40's)  
Four wings, RAF Wellingtons

## **Tactical Air Force**

### **TACTICAL BOMBER FORCE**

U.S. 47th Bomb Group (A-20's)  
U.S. 12th,\* 340th\* Bomb Groups (B-25's)  
Two RAF, one SAAF wings  
Two tac/recce squadrons

### **XII AIR SUPPORT COMMAND**

U.S. 33d, 324th\* Fighter Groups (P-40's)  
U.S. 31st Fighter Group (Spits)  
U.S. 27th, 86th Fighter-Bomber Groups (A-36's)  
U.S. 111th Observation Squadron

### **WESTERN DESERT AIR FORCE**

RAF and SAAF, but including U.S. 57th\* and  
79th\* Fighter Groups (P-40's)

\* Ninth Air Force

## **Coastal Air Force**

U.S. 81st, 350th Fighter Groups (P-39's)  
U.S. 52d Fighter Group (Spits)  
Three RAF wings  
Two air defense commands  
Miscellaneous units, including U.S. 1st and 2d  
Antisubmarine Squadrons

## **Troop Carrier Command**

U.S. 51st Wing: 60th, 62d, 64th Groups (C-47's)  
U.S. 52d Wing: 61st, 313th, 314th, 316th\*  
Groups (C-47's)  
RAF 38 Wing

## **Training Command**

Three replacement battalions  
U.S. 68th Observation Group  
Miscellaneous training units

## **Photographic Reconnaissance Wing**

U.S. 3d Photo Group  
Two RAF squadrons  
One FAF squadron

\* Ninth Air Force

## **ASSIGNED STRENGTH OF USAAF GROUPS**

1. Heavy bombers: 48 planes (4 sqs, 12 planes each)
2. Medium bombers: 57 planes (4 sqs, 13 planes each, plus  
5 hq planes)
3. Light bombers: 57 planes (4 sqs, 13 planes each, plus  
5 hq planes)
4. Dive bombers: 57 planes (4 sqs, 13 planes each, plus  
5 hq planes)
5. Fighters: 75 planes (3 sqs, 25 planes each)
6. Troop carrier: 52 planes (4 sqs, 13 planes each)

In each instance the strength was normal, except in the case  
of the heavies where normal unit equipment was 35 aircraft.

two B-24 groups (98th and 376th)\* from their bases in Cyrenaica. Not only did this permit full advantage to be taken of a well-established IX Air Service Command but it gave protection to the eastern Mediterranean with no real sacrifice of interest in Sicilian and Italian targets.<sup>6</sup>

The organization of NAAF bespoke a distinction between tactical and strategic operations which in the broader context of the war may prove misleading, however useful it may have been for the Mediterranean theater in 1943. Let it be noted, then, that the function of NAAF was almost exclusively tactical in nature; in other words, that its mission was one of cooperation in land and amphibious operations. That cooperation might be direct or indirect, it might be delivered by the relatively short-range planes of Tactical Air Force or, as in strikes against enemy transportation in Italy, by the longer-range aircraft of Strategic Air Force. But in any case, its purpose was to further the advance of our land and sea forces in accordance with plans for the occupation of specific geographical areas, and thus it differed basically from efforts to strike directly at the enemy's capacity to wage war. Except for the Ploesti and Wiener Neustadt missions of August 1943 and two attacks on Wiener Neustadt the following October, Mediterranean-based planes would not participate in purely strategic operations until after the establishment of the Fifteenth Air Force in November.

The operations of the Northwest African Strategic Air Force did, however, take on certain of the qualities of strategic bombardment. Its operations were continuous and only imperfectly punctuated by the successive phases of the ground campaign. Its objectives included an attempt to weaken the enemy in the general area of combat as well as in specific areas fixed by ground objectives. In the former it went far afield, striking at lines of communication, air bases, and other targets in an effort to reduce the enemy's strength. With reference to the more specific areas, its chief work was done well ahead of the ground attack. Thus in the planned assault on Sicily, the task of Strategic Air Force was to strike the enemy in advance of the amphibious forces which would make the final assault, to soften their objective, to assist in isolating the battlefield, and in all other possible ways to contribute to the success of the invasion. And with D-day set for 10 July, there could be no pause between the victory in Tunisia and the air attack on Sicily.

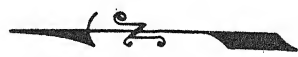
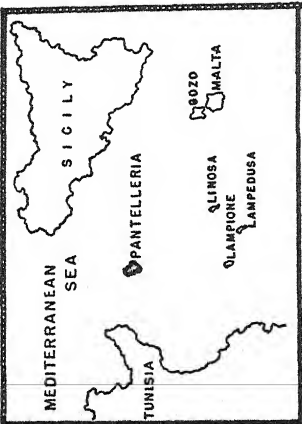
\* During HUSKY, three other B-24 groups would be added. See below, p. 478.

Not only were bombing operations continuous but they were directed in large part against targets long since made familiar in repeated attacks. By May 1943, Sicily itself had become an old target. Since the preceding February the island's airfields and ports had been the object of a growing attack delivered chiefly by B-17's of the Twelfth Air Force and B-24's of the Ninth, with some assistance from RAF Wellingtons, for the benefit of other Allied forces heavily engaged with the enemy in Tunisia. As part of the plan to isolate the battle area in North Africa, southern Italian and Sicilian lines of communication and Sicilian airfields had been bombed repeatedly in April.<sup>7</sup> Sardinian fields received almost equal attention, and on 4 April, SAF raised its sights to the Italian mainland in an attack upon Capodichino airfield on the outskirts of Naples. Thereafter, the Twelfth, Ninth, and RAF, Middle East collaborated in an offensive which grew steadily in size and fury. In a campaign against enemy ports—their shipping, harbor installations, and storage facilities—Palermo had been hit eight times during April, Messina and Trapani, six times each. Against the three Sicilian ports a total of 281 heavy bomber sorties had been flown.<sup>8</sup>

During the first two weeks of May, the effort to smash the remnants of Axis forces in the Bizerte-Tunis area left little time for other operations. But immediately upon the enemy's capitulation on 13 May, NAAF took up the task of reducing the island of Pantelleria. The assault on Pantelleria, under consideration as early as the preceding February,<sup>9</sup> had been given first place in operations preliminary to the invasion of Sicily.

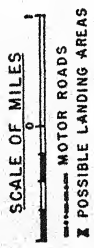
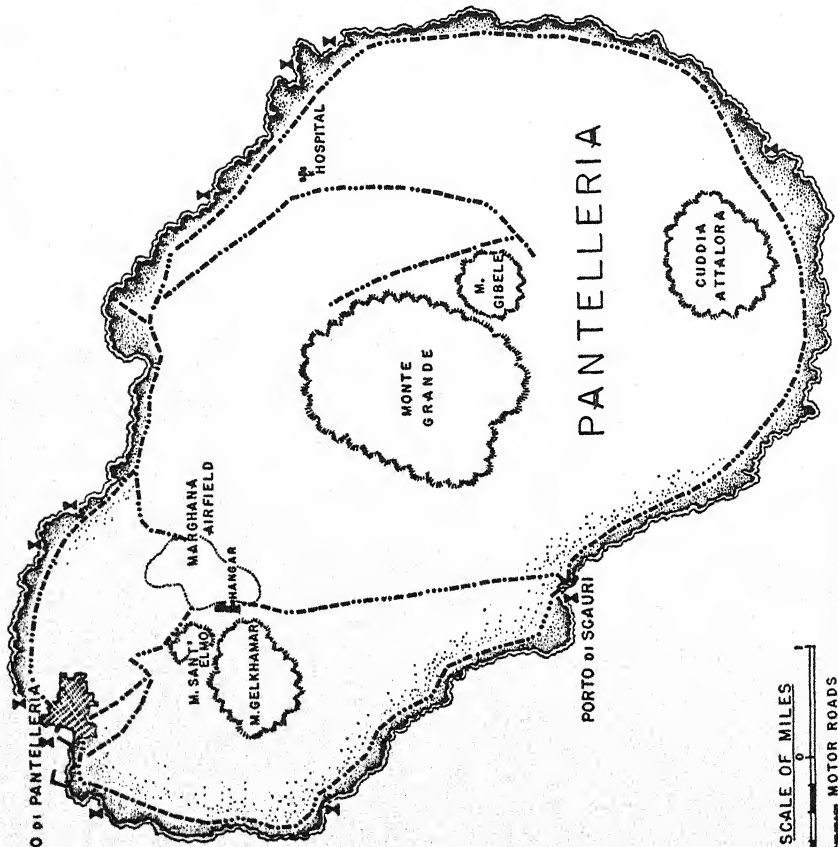
### *Pantelleria and Lampedusa*

Pantelleria was certainly not an "Italian Gibraltar," as the Fascist newspapers liked to call it; even so, there was good reason to believe that its conquest might be a troublesome and expensive operation. The island, lying fifty-three air miles from Cap Bon, Tunisia, and sixty-three miles from Cape Granitola, Sicily, is an outcrop of volcanic rock, roughly elliptical in shape and with an area of some forty-two and a half square miles. Its coast line is irregular and featured by steep cliffs and a notable absence of beaches. For an invasion there was only one feasible landing area, at and adjacent to the town and harbor of Porto di Pantelleria on the northwest end of the island, but even there the harbor is small and too shallow to accommodate any but vessels of light draft, the offshore currents are tricky, and the surf is high.<sup>10</sup>



fanito Lantier  
1948

Mediterranean



12°

Should a landing be effected, an invading force still might expect serious trouble. The terrain is hilly, with the highest peak, Montagna Grande, reaching an elevation of 2,743 feet. The soil consists largely of lava, pumice, and volcanic ash, much of it incapable of supporting heavy vehicular traffic. The surface is cut by numerous ravines and eroded channels. Hundreds of high, thick stone walls, which divide the arable land into fields, afford protection for defending ground troops, while each of the island's houses, square and of stone or plaster, could be turned into a miniature fortress.<sup>11</sup>

Since the middle 1920's the Italian government had strengthened the natural defenses of Pantelleria. At the northern end of the island an air-drome had been constructed. The airfield itself, with its longer axis measuring about 5,000 feet, was capable of handling planes as large as four-engine bombers. On its southeast side a huge "underground" hangar, some 1,100 feet long and containing an electric light plant, water supply, and repair facilities, had been built. The field and hangar together were capable of sustaining at least eighty fighter planes. The island had been a forbidden military zone since 1926 so that detailed information about its defenses was thin, but photographic reconnaissance during the Tunisian campaign had revealed the presence of more than 100 gun emplacements. Some of them were hewn from rock; others, of concrete, were covered by lava blocks. The largest concentration was around the harbor, with the remainder so located as to command the few additional places at which landings might be attempted. A number of the guns were of sufficient size to pose a serious threat to Allied vessels of war. These defenses were supplemented by pillboxes, machine-gun nests, and strongpoints scattered among the mountains and embedded in the faces of cliffs.\*<sup>12</sup>

Allied intelligence estimated the size of the garrison at approximately 10,000 men—a strength which seemed more than adequate for holding the island. With its natural and man-made defenses backed by a garrison of that size, Pantelleria might prove so formidable as to require a major effort for its reduction.<sup>13</sup> But in that garrison lay the island's chief weakness. Composed of diverse elements, none of them battle-tested or conditioned to intensive bombardment, Pantelleria's defenders were

\* Lampedusa, too, had good defenses. It was well covered by pillboxes, machine-gun nests, trenches, and barbed wire; it had four mine fields, each in an area where a landing might be effected; its coast line was almost a continuous cliff some 400 feet high, broken by numerous small bays and inlets; it held more than 4,300 troops, 2 platoons of tanks, and 33 coastal and AA guns.



aware of the overwhelming power unleashed by Anglo-American forces in the closing days of the Tunisian campaign. The island was isolated from the mainland and its garrison could hope for little assistance, either in the way of air protection or in the form of reinforcements. Allied intelligence assessed the garrison's morale as doubtful, a conclusion bolstered by the poor showing of Pantellerian aircraft units against Allied air attacks near the close of the Tunisian campaign.<sup>14</sup>

However its actual strength and possible weakness might be assessed, Pantelleria and the smaller islands of the Pelagie group—Lampedusa, Lampione, and Linosa—occupied a location of great strategic importance. Pantelleria and Lampedusa, so long as they were held by the enemy, would pose a serious threat to HUSKY. Their position in the Sicilian straits enabled them strongly to influence all ship movements through the narrows. Both islands held Freya RDF stations and both had observation posts from which to detect the movement of aircraft and ships. So long as Axis observation planes worked out from Pantelleria's airfield, no invasion mounted from North African ports could hope to achieve maximum tactical surprise. That airfield, with its capacity of eighty fighters, was a constant threat against Allied bombers and ships. The island's caves and grottoes served as refueling points from which submarines and torpedo boats menaced shipping in the central Mediterranean.<sup>15</sup>

Once the islands were captured, several advantages would redound to the Allies. From Pantelleria they could operate at least one group of fighters to protect shipping and ground troops during the early stages of the invasion of Sicily—an important tactical consideration since North African airfields were out of effective single-engine fighter range and those on the British islands of Malta and Gozo could not accommodate all of the fighters required. Both Pantelleria and Lampedusa would provide sites for weather stations and bases for air-sea rescue units, while the larger island's airfield would serve as a convenient emergency landing ground for crippled planes.

The importance of the two islands, especially of Pantelleria, argued for an early assault, but it was obvious that the venture involved certain serious risks. A protracted operation requiring large commitments in men, ships, and landing craft, with the possibility of heavy losses, might weaken or even postpone HUSKY. The assault would indicate the direction of Allied intentions in the Mediterranean. A successful—or even a lengthy and courageous—defense of the islands might stiffen the

spirit of the Italian army and people just when the Allies were most anxious to break their morale.<sup>16</sup>

These and other considerations caused some difference of opinion among ground, naval, and air forces as to the wisdom of an assault on Pantelleria and the nature of that assault should it be attempted. But after the Palermo landing had been dropped in favor of a concentrated attack in southeastern Sicily, Eisenhower concluded that Pantelleria must be seized and occupied: the value of its airfield to the HUSKY landings was a clinching argument. In the absence of satisfactory beaches for an amphibious assault, he decided upon an attempt to break the resistance of the garrison, and of the civilian population, by heavy bombardment from air and sea. Even if this attack alone did not force the island to surrender, it was believed that the damage to installations, materiel, personnel, and morale ought to insure for a landing an early success, with minimum losses.<sup>17</sup>

Plans for the conquest of Pantelleria, coded Operation CORKSCREW, matured rapidly. On 9 May, Eisenhower set in motion preliminary preparations. He directed Tedder to make available for the operation the full strength of the Northwest African Air Forces, supplemented, if necessary, by heavy and medium bombers from the Middle East command. Fleet Adm. Sir Andrew Browne Cunningham, commander of naval forces in the theater, was to select a striking force of warships and other vessels for the assault and to provide naval protection for the movement of one infantry division. Together with the Northwest African Coastal Air Force, he also had responsibility for maintaining a close blockade of the island. For the landing operation, Eisenhower chose the British 1 Infantry Division, which had received training in amphibious warfare in England but was not slated to participate in the invasion of Sicily.<sup>18</sup>

A combined command—General Spaatz of NAAF, Maj. Gen. W. E. Clutterbuck of the British 1 Infantry Division, and Rear Adm. R. R. McGrigor of the Royal Navy—would command air, ground, and naval forces, respectively. With the final assault set for 11 June, these commanders had authority to postpone the landing to permit further bombardment. General Eisenhower retained responsibility for any decision, in the face of dangerous opposition and possible heavy losses, to abandon the project.<sup>19</sup>

Since CORKSCREW was to be launched from Tunisia, a portion of NAAF headquarters moved from Constantine in Algeria to Sousse,

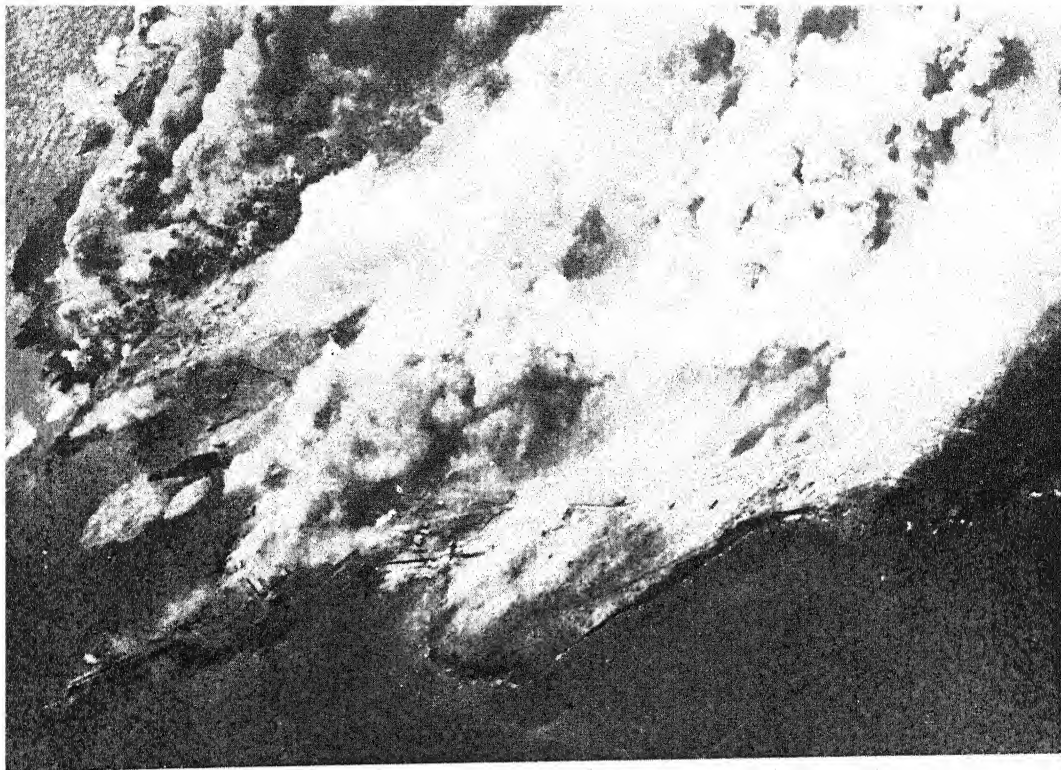
where, with representatives of other elements participating in the enterprise, it cooperated in establishing a combined headquarters on 25 May. At the same time AFHQ created the 2690th Air Base Command, composed of air service troops under the command of Brig. Gen. Aubrey C. Strickland, to administer Pantelleria's affairs after its occupation and to service air units to be based there.<sup>20</sup>

For Operation CORKSCREW—the first Allied attempt to conquer enemy territory essentially by air action—the Northwest African Strategic Air Force and Tactical Air Force had at their disposal slightly more than 1,000 operational aircraft.\* This figure included the two groups of medium bombers and three groups of fighters of the Ninth Air Force, which were attached to NATAF. In addition, Malta-based planes could attack enemy airdromes in Sicily and protect naval forces operating from Maltese ports, while a part of Coastal's planes could be used in the Pantellerian operation if necessary.<sup>21</sup>

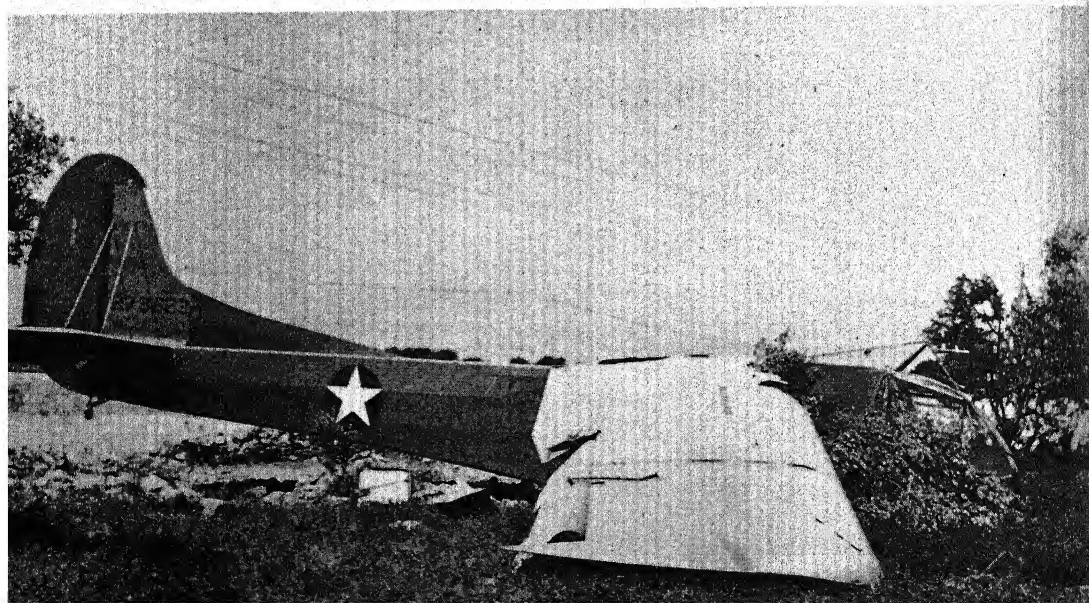
Strategic Air Force was committed in whole to the operation. Of its units—four groups of USAAF B-17's, two of B-25's, three of B-26's, three of P-38's, and one of P-40's, and three wings of RAF Wellingtons and another belonging to the South African Air Force (SAAF)—all but two wings of Wellingtons participated. Tactical Air Force was only partly committed: its RAF No. 242 Group had recently been transferred to Northwest African Coastal Air Force, while Western Desert Air Force and two Spitfire wings were moving to new bases from which to participate in the coming invasion of Sicily. USAAF units scheduled for CORKSCREW were two B-25 groups; three P-40 groups plus the 99th Squadron (Separate); one group each of Spitfires, A-36's, and A-20's; and one observation squadron. There were also two RAF and two SAAF Boston squadrons, two RAF and one SAAF Baltimore squadrons, and two RAF tactical reconnaissance squadrons.<sup>22</sup>

To oppose NAAF's combat elements the German Air Force on 20 May had in the Mediterranean an estimated 989 combat planes: 541 fighters and fighter-bombers, 240 bombers, 97 close- and long-range reconnaissance, 58 ground attack, and 53 coastal. Of the total, 578 were serviceable. The Italian Air Force had 901 fighters and 484 bombers, a total of 1,385 combat planes, of which 698 were serviceable. Combined Axis air strength in the entire Mediterranean thus came to 2,374 combat planes, 1,276 of which were serviceable. But these planes

\* Units of NASAF were located in the Constantine, Souk-el-Arba, and Djedeida areas. Units of NATAF were chiefly in the Cap Bon area and southward as far as Hergla.







were scattered from northern Italy to Pantelleria, from Sardinia to Greece, and it was estimated that the enemy had only about 900 operational combat planes on and within range of Pantelleria.<sup>23</sup> Thus, as the air assault on the island began, the Allies had a definite but not overwhelming superiority over the Axis.

Although Pantelleria, like Sicily, had been hit more than once during the closing days of the Tunisian campaign and MAC on 14 May had ordered a "blockade by air and sea" with intermittent air attacks for "nuisance purposes,"<sup>24</sup> the real offensive against the island began on 18 May under a plan calling for fifty medium bomber and fifty fighter-bomber sorties per day through 5 June (D minus 6).<sup>25</sup> During this first period, operations were directed principally against Porto di Pantelleria and the Marghana airdrome in an effort to forestall the building up of reserve supplies by the enemy. These attacks (which were regular and heavy from 23 May) and a naval blockade had almost completely isolated the island by the end of the month. Photo reconnaissance reports indicated that between 29 May and 4 June only three small vessels arrived at Porto di Pantelleria and that its facilities and surrounding buildings had been severely damaged. Equally effective had been the attacks on the airdrome where barracks and administrative buildings had been destroyed, stores and dumps fired, the field itself cratered, and a large number of aircraft destroyed on the ground. After May, reconnaissance could discover no serviceable planes on the field—a fact which helped to explain the absence of enemy fighter opposition during this first stage of the assault—and when Allied forces later moved ashore they counted eighty-four enemy aircraft abandoned on the airdrome.<sup>26</sup> Between 15 and 30 May, heavies and mediums had vigorously complemented the assault on Pantelleria by attacking airdromes in Sicily, Sardinia, and on the Toe of Italy. While these blows protected the Pantellerian operation, they also prepared the way for HUSKY.<sup>27</sup>

On 1 June, when B-17's first participated in the direct assault on Pantelleria, the emphasis shifted from the harbor and airdrome to an attempt to neutralize coastal batteries and gun emplacements—a task of special concern to the Allied command. On that day, heavies, P-38's, and P-40's dropped 141 tons of bombs; on 4 June, B-17's, B-25's, B-26's, Wellingtons, P-38's, and P-40's unloaded more than 200 tons. Bostons (A-20's) had joined the attack on 3 June. Between 18 May and 6 June, NAAF's planes, flying approximately 1,700 sorties, had battered the



port and airfield with over 900 tons of bombs and had thrown an additional 400 tons against gun positions.

Plans for the destruction of some eighty gun positions of major importance had been predicated on the assumption that if one-third of the guns in each battery could be rendered useless as a direct result of air attack, the remainder might be silenced by the effect of such secondary factors as damage to scientific instruments, disruption of communications, destruction of supplies, and demoralization of crews. The continuous bombardment would limit opportunities for repairs. Careful analysis of the island's defenses had fixed priorities for specific objectives. Daily coverage by the photographic reconnaissance wing made possible a critical examination of results as the bombing proceeded and provided indispensable assistance in the briefing of crews. This last was considered of special importance not only because the targets were extremely small but because preliminary estimates had indicated that the 1,000-pound bombs, the chief type used, would have to fall within 200 yards of the guns to effect material damage.<sup>28</sup>

As the second phase of the air attack opened on 6 June, the plan called for an around-the-clock assault that would continue with growing intensity to D-day on 11 June. The first day saw Strategic's heavies and Tactical's A-20's, B-25's, and Baltimores, with assistance from the new A-36 (a fighter-bomber version of the P-51), lay on a heavy attack. On 7 June around 600 tons of demolitions were showered on the island, most of the bombs being directed against shore batteries. The weight of attack rose to approximately 700 tons on 8 June, on the next day to 800 tons, B-17's carrying the bulk of the load, and then on 10 June the Allied command unleashed the full force of its air power. During that day of continuous attack, bombers at times were forced to circle over the target waiting for earlier arrivals to drop their bombs. In all, nearly 1,100 planes participated in the climactic assault and dropped 1,571 tons of bombs to bring the grand total for the period extending from 1 through 10 June to 4,844 tons, a tonnage delivered in 3,647 sorties.<sup>29</sup>

Prior to 6 June the German and Italian air forces had made little effort to protect Pantelleria, but as the air assault mounted in intensity, NAAF began to meet opposition. Small groups of enemy fighters attempted interception during the 6th and the 7th; for two days thereafter the enemy effort dwindled and then increased as the Allied attack reached its climax on 10 June. Offensive strikes against NAAF bases

were limited to a fighter-bomber attack of 7 June on the landing grounds at Korba North and a night raid of 10/11 June by fifty planes on Sousse. These and other efforts, however, had little effect on NAAF operations. It was estimated that Axis losses during the first ten days of June totaled nearly sixty planes, a figure four times that for Allied losses over Pantelleria from 18 May to 10 June.<sup>30</sup>

On five occasions between 31 May and 5 June, the Allied air assault was supplemented by naval bombardment of Pantelleria's harbor and surrounding gun positions. The attacking forces, all of which were British, in no instance exceeded a complement of one cruiser and two destroyers. On the 8th, however, units of the Royal Navy launched a full-scale attack. Five light cruisers, eight destroyers, and three torpedo boats participated in a bombardment of Porto di Pantelleria's mole and dock and near-by batteries. The enemy's reply to the six attacks from the sea was weak and inaccurate; observers concluded that the severe air attacks of the previous week had left most of the batteries useless.<sup>31</sup>

According to plan, the island twice was offered a chance to surrender prior to D-day. On the 8th (D minus 3), immediately after the naval bombardment, three pilots of the 33d Fighter Group dropped messages demanding immediate cessation of hostilities and unconditional surrender of all military personnel. Immediately after the drop, bombers showered the island with thousands of leaflets which pointed out the futility of further resistance and the advantage in sparing the island the ordeal of continued bombings. When, after a six-hour respite, prescribed signals of surrender had not been displayed, the air assault was renewed. A second call, made on the 10th (D minus 1), likewise met with no response.<sup>32</sup>

After the failure of this second call, final preparations for the ground assault were completed and on the night of 10/11 June the British 1 Infantry Division embarked at Sousse and Sfax in three convoys, two fast and one slow.\* The fast convoys, protected by fighters of NACAF and by surface craft, were met off Pantelleria about daybreak of the 11th by a British naval squadron from Malta. Eight miles from the harbor entrance to Porto di Pantelleria the ships lowered their assault craft preparatory to moving ashore.<sup>33</sup>

During the night of 10/11 June and up to 1000 hours on the 11th, the Allied air forces smashed at gun positions in an all-out assault. Forma-

\* The troops sailing from Sousse were to be employed in a ship-to-shore assault; those from Sfax, for the first time in the Mediterranean, in a shore-to-shore assault.

tions of medium bombers with fighter escort appeared over the island on an average of every fifteen minutes. Tactical Bomber Force (comprised of TAF's mediums) completed its bombing missions at 1000 hours, and thereafter its duties consisted largely of furnishing fighter cover over the landing areas and of standing ready to provide such other assistance for the ground forces as might be required. Control of all Tactical Air Force activities, except for a few prearranged flights, now passed to the NAAF officer in the combined headquarters aboard HMS *Largs*. Plans called for Strategic Air Force to renew the bombing attack at 1100 hours.

During the lull in Allied bombing operations, the landing craft started shoreward at about 1030. Up to this point the enemy had made several sporadic air attacks from Sicily, none of sufficient strength to interfere with the prelanding operations; now he made his major effort with an attack on the flotilla by a large formation of FW-190's, which was followed by an attempted strike against the assault craft by five Me-109's. But the Focke-Wulfs failed to score a hit, and the Messerschmitts were driven off before reaching their objective by P-40's of the 57th Fighter Group.<sup>34</sup>

At 1100 hours ships of the 15th Cruiser Squadron opened fire on shore targets. A few minutes later, as the landing craft neared the end of their run, B-17's plastered the battered island with tons of bombs in a fine exhibition of flying and bombing. Between 1130 hours and 1200 hours a destroyer and several planes reported a white flag flying from "Semaphore Hill"; word was flashed to headquarters and a photo plane was dispatched immediately to secure confirmation of the report. Meanwhile, the landing operation continued. As the first assault craft reached the three beaches in the harbor area at about 1155, the naval bombardment ceased. The landings met no opposition except on one beach, where small-arms fire was quickly silenced; in the words of a British joint committee which reported on operations in the Mediterranean in 1943, "in effect active resistance on Pantelleria had ceased when the amphibious forces arrived." More troops quickly poured ashore and by 1220 hours the 3 Infantry Brigade was through the town and in possession of a sizable beachhead. The only casualty was a British infantryman who was nipped by a local jackass. Lack of opposition made it unnecessary for Strategic to lay down a scheduled expanding barrage, and for Tactical to carry out its assigned mission of close cooperation.<sup>35</sup>

While the troops were going ashore a message forwarded from Malta brought the information that Vice Adm. Gino Pavesi, military governor of Pantelleria, had asked to surrender. (On the previous night Pavesi had informed Rome that "the Allied bombing could be endured no longer"; Mussolini then had "personally ordered" the surrender of the island.\*<sup>36</sup>) Further bombing missions were promptly canceled, although twelve fighter-bombers and twelve medium bombers were held in readiness for call and fighter cover was maintained over the island throughout the day. Soon after 1330 hours General Clutterbuck and his staff went ashore, and at 1735 the formal surrender of flea- and fly-ridden Pantelleria was signed in the "underground" hangar.<sup>37</sup>

Already, General Eisenhower had shifted his attention to Lampedusa whose small airfield and RDF station would be useful in providing convoy cover, and before mid-afternoon of the same day twenty-six B-26's were on their way to open an air assault on that island. Throughout the afternoon B-25's, A-20's, and A-36's of Tactical Air Force poured bombs on the port and town of Lampedusa and on near-by gun positions. During the night Wellingtons continued the offensive. Enemy reaction was confined to inadequate but fairly accurate AA fire and to attacks by long-range fighters, fourteen of which were shot down for the loss of three Allied fighters. Before midnight a British naval task force of four light cruisers and six destroyers, accompanied by an LCI carrying one company of the Coldstream Guards, reached Lampedusa from Pantelleria and opened up against installations in a bombardment supplementary to the air attack.

On the morning of the 12th unfavorable weather stopped the naval bombardment after 0630 hours but the air assault continued. Mediums and fighter-bombers swept in relays across the island.† They encountered almost no AA fire, and the few long-range enemy fighters met refused combat. By late afternoon the Allies had flown some 450 sorties, severely damaging the island's principal installations and neutralizing one-third of its batteries with around 270 tons of bombs. Four nickeling missions showered surrender leaflets on the town and airfield. The island, having failed in an effort to surrender to an RAF sergeant pilot who had landed on the airfield because of motor trouble, displayed

\* According to a cable from the British 1 Maintenance Division to AFHQ (MC-IN-6468, 15 June 1943), the Italians on Pantelleria declared that only "fear of reprisals" had prevented an earlier surrender.

† Heavies that day returned to their old targets, the Sicilian airfields.

white surrender flags around 1900 hours. Thereafter, negotiations were completed quickly, although the local commander refused to sign the surrender terms "until he was reminded that we had another 1,000 bombers at our call; then he borrowed a pen and signed."<sup>38</sup> The Coldstream Guards went ashore to take charge of some 4,000 military and 3,000 civilian personnel, and on the morning of the 13th the island officially passed under Allied control.<sup>39</sup> With the prompt occupation of Linosa and Lampione by British naval units the entire Pelagie group, and thus all islands in the Sicilian strait, had come under Allied control. Neither of these last two had to be bombed or shelled.<sup>40</sup>

No sooner had Pantelleria capitulated than the Allies began to prepare it for its part in the invasion of Sicily. They rounded up and evacuated from the island more than 11,000 prisoners of war. Northwest African Air Service Command, during the month-long air assault, had serviced and repaired the planes which wrecked Pantelleria and kept operational the Tunisian airfields from which the air forces operated. Now its 2690th Air Base Command, coming ashore on the heels of the ground troops, began the task of cleaning up the badly battered island. The harbor area, roads, the communication system, the airfield, and gun emplacements were restored to usefulness. By 26 June the effective work of the 2690th ABC had made it possible to establish on Pantelleria the 33d Fighter Group, which since D-day had maintained patrols over the island and protected shipping from occasional raids by enemy planes. On 17 June, General Strickland had been appointed military governor, vice General Clutterbuck.<sup>41</sup>

When HUSKY got under way on 10 July, Pantelleria had become a full-fledged Allied air base, and its fighter planes, rescue units, weather station, and emergency landing ground helped the air forces to give maximum cooperation to the ground troops as they swarmed ashore at Gela and Licata.<sup>42</sup> Nor was the usefulness of Pantelleria—and of Lampedusa (whose airfield was serviceable by 20 June)—limited to support of the Sicilian campaign. The Allies could now place a strong defensive air umbrella over the Sicilian narrows. The sea route from Alexandria to Gibraltar could be kept open with greater security and smaller losses. Some of the pressure on Malta was relieved.<sup>43</sup>

CORKSCREW not only paid handsome dividends but because it offered unmistakable proof of the power of air bombardment to force a defended area to capitulate, it seemed destined to become a military classic. The only comparable instance was the capture of Crete by the

Germans in 1941, but at Crete the air bombardment had been followed by an airborne invasion and the troops who went in by parachute, glider, and transport plane met stiff resistance. At Pantelleria the conquest had been accomplished almost exclusively through air bombardment and surrender had come before the assault troops could contribute to the defender's collapse. The significance of this achievement even led some enthusiastic airmen to affirm that the operation offered proof that no place and no force could stand up under prolonged and concentrated air bombardment.

That contention is hardly supported by the record of CORK-SCREW alone. The enemy had certainly not prepared for all-out resistance. Batteries and pillboxes were but poorly protected and scantily camouflaged. There were no shelters adjacent to the guns for crews or ammunition. Communication lines were laid above ground, and wire was used sparingly.<sup>44</sup> Conditions on Pantelleria had been unusually favorable for the use of air power and there could be no doubt that the Allies had taken full advantage of the opportunity to give the island a severe beating.\* The docks at Porto di Pantelleria were badly damaged and the town was a shambles. Roads were cut or obstructed by debris and at some points almost obliterated. The communication system was so completely knocked out that "no telephone line was intact." The electric power plant was destroyed and its lines broken in many places. The water mains were smashed, although—despite the Italian claim that lack of water had forced their surrender—there was a sufficient supply to meet all needs, provided it could be distributed. The airfield was

\* From 8 May to 11 June, the Northwest African Air Forces flew 5,285 sorties against Pantelleria, dropping 6,200 tons of bombs on the island. This was done with a loss of only four aircraft destroyed, ten missing, and sixteen damaged over the island itself. The following units participated in the assault: Strategic Air Force—U.S. 2d, 97th, 99th, 301st Bombardment Groups (B-17's); U.S. 17th, 319th, 320th Bombardment Groups (B-26's); U.S. 310th, 321st Bombardment Groups (B-25's); U.S. 1st, 14th, 82d Fighter Groups (P-38's); U.S. 325th Fighter Group (P-40's); RAF 205 Group (Wellingtons); Tactical Air Force—U.S. 12th and 340th Bombardment Groups (B-25's); U.S. 47th Bombardment Group (A-20's); U.S. 27th Fighter-Bomber Group (A-36's); U.S. 33d, 57th, 79th Fighter Groups (P-40's); U.S. 31st Group (Spits); RAF 326 Wing (Bostons); RAF 232 Wing (Baltimores); SAAF 3 Wing (Bostons and Baltimores); two RAF tac/recce squadrons. Of the USAAF units all belonged to the Twelfth Air Force except the 12th and 340th Bombardment Groups and the 57th and 79th Fighter Groups; these were units of the Ninth Air Force but were attached to NAAF. It should be noted that the 324th Fighter Group (P-40's), attached from the Ninth, flew coastal missions but had no direct part in the assault. (See AAF Historical Study No. 52, *The Reduction of Pantelleria and Adjacent Islands, 8 May-14 June 1943*, p. 16, chart.) USAAF units carried the bulk of the assault, flying 83 per cent of the sorties and dropping 80 per cent of the bombs. (See AAFHS-52, p. 110.)



heavily cratered.<sup>45</sup> But the island-fortress had been badly damaged, not destroyed.

The "underground" hangar had proved to be impervious, even to direct hits, although a single attempt at skip-bombing by a P-38 had slightly damaged one of the doors. Only a few of the batteries were damaged sufficiently to prevent their being fired by determined crews. Bombing had been less accurate than expected: it had been predicted that 10 per cent of the bombs dropped would fall within a 100-yard radius of the batteries, but mediums had averaged only 6.4 per cent, heavies 3.3 per cent, and fighter-bombers 2.6 per cent. Consequently, only about one-half as many guns were destroyed as had been expected. Too, the use of delayed-action bombs against a soft surface had resulted in many craters but very little horizontal splintering so that the ratio of indirect to direct damage proved to be 4 to 1 instead of 2 to 1 as had been anticipated. Even so, indirect damage exceeded direct—gun platforms were upheaved, electrical connections severed, instruments damaged, control posts and communications destroyed, and many guns which otherwise could have been called serviceable were so covered with debris that several hours would have been needed to clear them. Most of the batteries were in no condition to oppose the landings.<sup>46</sup>

In the final analysis the morale of the defenders was the determining factor in the failure of Pantelleria to put up a strong and prolonged resistance. The air assault not only hurt the enemy's ability to resist; it broke his will. Statements by prisoners of war indicate that battery crews did not remain at their posts and that both soldiers and civilians took to cover or fled to the relatively safe hills in the central and southern parts of the island. Although fewer than 200 of the garrison had been killed and it still possessed fighting capabilities, it surrendered almost without a fight and even had initiated plans to capitulate before the Allies came ashore. It should be remembered that the batteries were subjected to a bombing intensity which averaged 1,000 tons per square mile; that the garrison was composed of men neither battle-tested nor inured to heavy and continuous bombardment; and that the island was isolated and could expect no help. The early withdrawal of all but 78 of 600 Germans indicates that long before the Allies went ashore the enemy had written off the island as lost.<sup>47</sup>

Attempts to compare the defenders of Pantelleria with those of Malta have tended to overlook significant differences—that Malta possessed air protection and that the enemy's raids had been sporadic and

marked by relatively inaccurate bombing. It could be argued—as men have—that an American, a German, or a Japanese garrison on Pantelleria would have made the landing a costly affair, but the fact remains that the Allied air forces bombed the island into submission. There were no bloody beaches at Pantelleria or Lampedusa.

Valuable lessons were learned from CORKSCREW. Improvements were needed in communications, in comprehensive briefing of aircrews, and in coordination of intelligence in the three arms of a combined force. The operation also made it plain that great care must be exercised in setting up a bomb line and that some system of canceling a prearranged bombing plan should be available to a forward headquarters. Extremely useful experience was gained in the use of a headquarters ship for the control of fighters. Still more important, Operation CORKSCREW from the beginning had been a test of the tactical possibilities of scientifically directed air bombardment of strongpoints and an exercise in the most economical but effective disposal of available air strength. The evidence showed how extremely difficult it was to obtain direct hits on an object as small as a gun emplacement even when there was little or no enemy interference. Examination of eighty guns which had been attacked from the air showed that forty-three of the eighty had been neutralized, ten of them being completely unserviceable, but that only two batteries had received direct hits. Inconclusive evidence indicated that in attacks on batteries the effective radius of the U.S. 1,000-pound bomb was only one and a half times that of the 500-pound bomb; hence, it was better to use the smaller bomb against pinpoint objectives because of the larger number of bombs which could be employed. Bombs with a delay of .025 seconds gave better results against fixed installations than bombs with instantaneous fuzes; the delayed action restricted splintering but caused greater damage from debris to delicate instruments and produced heavier ground shock. Results, indeed, showed how important it was to make a careful study of the characteristics of terrain and soil before beginning a bombardment campaign. Of significance for later air-ground operations was the evidence that strafing had only a temporary value in intimidating gun crews and should be used with other forms of attack.<sup>48</sup> The bombing of Pantelleria with the subsequent study of results had many of the characteristics of a laboratory experiment in its influence on the analysis of target information and the development of operational techniques.

The reduction of Pantelleria provided an excellent test of the pattern

of operations which the Allies would use as they moved northward in the Mediterranean: landings would be preceded by a period of intensive air attacks by land-based planes, the attacks constantly increasing in tempo. Such a system required time and a large expenditure of bombs and gasoline; and it placed a heavy strain on aircrews, planes, and maintenance personnel. But it greatly improved the odds in favor of establishing and maintaining a beachhead, and—under a more general application—it contributed materially to later successes on the ground by isolating the battlefield so that the enemy was denied supplies, reinforcements, and freedom of movement. Thus, it saved Allied ground troops; and, in the long run, it saved combat air personnel.<sup>49</sup>

### *Softening Up Sicily*

After the fall of Pantelleria the air forces turned to tasks more immediately preliminary to the conquest of Sicily. They operated under a plan which stipulated that a primary responsibility of all NAAF units through D minus 7 should be the build-up of forces for the combined assault. Until that day, in order to avoid heavy losses and to allow for refitting, no more than steady pressure was to be maintained against the enemy.<sup>50</sup> But even this minimum requirement demanded that every possible effort should be made to limit opposing air action threatening the build-up of Allied forces in North Africa and to disrupt lines of communication upon which the enemy's own strength depended. For the remainder of June, therefore, Allied air forces were engaged in a heavy but by no means all-out attack on enemy airfields and ports.

In this they had returned to a task taken up immediately after the fall of Tunisia. The operation against Pantelleria had demanded freedom from interference by the Axis air arm and maximum interdiction of supplies and reinforcements for the enemy. During the latter part of May the principal airfields of Sicily and Sardinia had been bombed often and hard, and when in consequence the Axis withdrew most of its bombers from their island bases to southern Italy, the Allied air forces had promptly extended their attacks to the mainland. In the last week of May they had struck heavy blows at Foggia and the two principal fields in the Naples area—Capodichino and Pomigliano. Through the first part of June they had concentrated on Pantelleria itself, with collateral missions limited to a few fighter-bomber attacks on Sicilian landing grounds, but the assignment to which NAAF now turned was new only in the sense that it had a new focus.<sup>51</sup> Missions theretofore

had been flown with a view to the needs primarily of the Pantellerian operation. Henceforth, all efforts would be concentrated in direct preparation for HUSKY.

Chief attention went to the airfields of Sicily, where the Axis boasted nineteen principal airdromes and landing grounds and in addition a dozen newly constructed fields of lesser importance. The Sicilian airfields fell into three main groups, of which the Gerbini complex in the east was the most important. That complex became the major responsibility of the RAF and Ninth Air Force's Cyrenaica-based heavies, which gave special attention to Catania, Gerbini, Comiso, and Biscari. In a natural division of labor, NAAF directed its efforts against fields in the western part of the island. Its heavies bombed Castelvetro and Boccadifalco, USAAF mediums struck Sciacca and Borizzo in particularly devastating attacks, and when Wellingtons joined the effort during the last week of the month, Castelvetro received a hard blow by night. The heaviest attacks on a single day came on 30 June, when almost 200 sorties were flown against Sciacca, Boccadifalco, Borizzo, and Trapani/Milo. Since earlier bombings had forced the enemy to withdraw his bombers and reconnaissance planes from Sardinia, that island required only occasional attention. On 24 June, 36 B-24's bombed Venafiorita, and 119 mediums raided Alghero, Decimomannu, Milis, and Venafiorita on the 28th. IX Bomber Command, carrying the attack eastward to Greece, struck at Sedes airdrome (Salonika) with 49 B-24's on 24 June and at Eleusis and Kalamaki with 46 Liberators four days later. Results everywhere were good.<sup>52</sup>

It was assumed that the conquest of Pantelleria had given some indication of the Allies' next objective. Accordingly, between 18 and 30 June the planes of NAAF flew 317 heavy and 566 medium bomber sorties, with the help of 107 sorties by IX Bomber Command, for the purpose of blocking efforts to reinforce Sicily. The selected targets emphasized key supply points, terminal ports, marshalling yards along Italy's western coast, and lesser Sicilian ports of importance to coastal traffic.

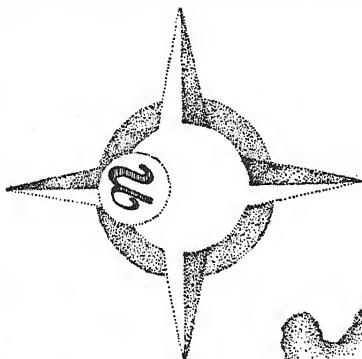
Messina, terminus of the principal line of supply from the mainland to Sicily,\* became the chief target. Seventy-six Fortresses struck the first blow on 18 June. Wellingtons followed with several night attacks. On 25 June, 130 B-17's of the 2d, 97th, 99th, and 301st Bombardment Groups pounded the ferry, railroad yards, docks, and warehouse areas

\* Messina had a daily clearance capacity of between 4,000 and 5,000 tons.

## MEDITERRANEAN

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with more than 300 tons of bombs in the heaviest single attack made in June by NAAF. These missions against Messina were complemented by attacks on Reggio di Calabria and San Giovanni across the strait on the mainland, Ninth Air Force Liberators hitting each target twice. Wellingtons and B-17's also laid three attacks on Naples; Wellingtons and B-25's pounded Salerno. On 28 June, 97 Fortresses dropped 261 tons of bombs on Leghorn, severely damaging industrial and railway installations. Wellingtons and USAAF mediums renewed the attack on Sardinian targets—Olbia, Golfo Aranci, and Cagliari—while forty-four P-40's carried out an unusually successful fighter sweep over the island, in the course of which they destroyed eight enemy planes, set fire to two vessels near Cagliari, and seriously damaged the railway station at La Maddalena. Between 12 June and 2 July, NAAF planes dropped a total of 2,276 tons of bombs on ports and enemy supply bases. Messina, attacked eleven times with a total of 829 tons, received by far the heaviest pounding. Olbia had been attacked five times, Naples and Cagliari four times each, Palermo and Golfo Aranci three times.<sup>53</sup> The wide distribution of targets, as in the simultaneous campaign against airfields, bespoke a purpose partly to keep the enemy in the dark as to Allied intentions.<sup>54</sup>

The enemy's air opposition during this period had been inconsistent both in quality and quantity. NAAF bombers encountered the greatest number of fighters over northeastern Sicily and southern Italy. The bombers claimed sixty-two fighters shot down against a loss of only seven planes, though as was the experience of IX Bomber Command, which claimed a total of forty-one destroyed without loss to itself, many of the American planes were damaged.

To Malta must be given some of the credit for the bombers' success. From a besieged island forced to devote its full efforts to defense, Malta had become an effective forward base for offensive air operations. On it now were based advanced headquarters of Desert Air Force, all of that organization's fighter squadrons, and many other of its units. Malta-based fighters, assisted by Spits from the near-by island of Gozo, furnished cover and escort for NAAF and Ninth Air Force bombers within a 100-mile radius of the two islands, supplied diversions for the bomber attacks, carried out their own offensive sweeps, and through missions undertaken by Spitfire fighter-bombers added weight to the attack on enemy airfields in southern Sicily.<sup>55</sup> And even more important, Malta stood ready, as did Pantelleria to the west, to offer power-



ful assistance in guaranteeing control of the air over the waters through which soon would pass the amphibious forces of the Allied assault on Sicily.

The final phase of pre-HUSKY air operations began on 2 July (D minus 8) when the Allied air forces launched a systematic attack of growing intensity against enemy airfields for the purpose of eliminating effective air opposition to the invasion. Reconnaissance indicated that the enemy had largely withdrawn his fighters from the western fields of Sicily and from the bases around Palermo in the north for concentration chiefly in the Gerbini complex. He earlier had pulled back his bomber force to the mainland fields of Italy, and so the task in the final week preceding the invasion was mainly that of concentrating Allied efforts against the fields of eastern Sicily and of attempting to force a further retreat of the bombers northward in Italy. It would be necessary also to render unusable advanced fields in Sardinia from which long-range bombers might attack the HUSKY force and similarly to discourage the use of more northerly situated bases in Italy. From D minus 8 to D-day, in short, the primary mission of Allied air forces was to knock out the enemy's aviation.

Abandoning the earlier division of responsibility between NASAF and IX Bomber Command, the heavies of both organizations concentrated their blows on Gerbini and its satellites. The mediums of NATAF took over responsibility for the fields of western Sicily, and geographical considerations tended to give the Ninth Air Force the major part of the job over southern Italy. In planning the final knock-out, it was fully understood that attacks would have to be well timed and often repeated, for experience had shown that spasmodic raids, causing only temporary damage, seldom produced decisive results. Areas containing a number of fields were divided into sectors for specific assignment to definite formations of planes. On some occasions heavy attacks would be laid on all but one or two fields in a given area, and then when the enemy diverted his fighters to the unscathed fields the Allies followed with a concentrated blow on them. Increasing attempts by the GAF to achieve maximum dispersion by use of satellite "strips" were countered by mass strafing and fighter-bomber attacks, a method which proved particularly effective against the Foggia and Gerbini complexes. A follow-up with fragmentation bombs added measurably to the effectiveness. Enemy fighters on patrol frequently

returned home to find that there was no runway on which they could land.<sup>56</sup>

The weight of the attack was delivered by the heavy bombers in missions both near and far. Employing usually formations of twenty-four planes in six-plane flights, the heavies went out from their fields in Africa again and again with each flight carefully briefed on a specific target. Experience showed that an attack about noon took advantage of the position of the sun and was more likely to achieve the desired surprise. The type of bomb carried depended on the target. For hangars and installations the U.S. 500-pound GP was considered the best, while for dispersal areas the 100-pound demolition and the 20-pound fragmentation bomb in 120-pound clusters got the best results.<sup>57</sup> At the beginning of the week-long attack, the bombers carried fragmentation clusters in large numbers for the purpose of destroying aircraft on the ground. As D-day approached, they substituted demolition bombs in an effort to put installations out of commission.

Ninth Air Force opened the campaign on 2 July with ninety-one B-24's sent against the airdromes at Grottaglie, San Pancrazio, and Lecce, all in the Heel of southern Italy. On the following day NASAF hit the advance landing grounds of Sardinia. Then for three days NASAF and the Ninth combined their forces in a smashing assault on the fields of eastern Sicily, while the mediums of NATAF pounded the airfields lying in the western and central parts of the island. Gerbini and its satellites received a thorough battering, the outstanding blow being delivered by B-17's on 5 July with an estimated destruction of 100 enemy planes. While Wellingtons operated by night against Sardinian airdromes, the attack on Sicilian fields continued through the final three days before D-day. Between 3 and 9 July, NAAF aircraft dropped 1,323 tons of bombs on the Gerbini complex alone, and to this weight planes of the Ninth Air Force added 197 tons.

As a result, Gerbini and seven of its twelve satellites had been rendered unserviceable by D-day. Other key fields fared not much better: Castelvetrano was abandoned, Comiso and Boccadifalco could not be used, lesser Sicilian fields and those in Sardinia had been largely neutralized. In Sicily, only Sciacca and Trapani/Milo were fully operational. Photo reconnaissance indicated that approximately half of the enemy's Sicily-based planes had been driven from the island to the mainland, and by the close of the HUSKY operation Allied personnel had counted approximately 1,000 enemy aircraft abandoned or destroyed

in Sicily. The persistent bombing of the week preceding the invasion also had forced the enemy to come up and fight with results that are indicated by Allied claims of 139 planes shot down in combat. Conclusive proof of the work done came on D-day, for on that day the Allied air forces dominated the air over Sicily. Indeed, the enemy's air arm interfered so little with the subsequent land campaign that it soon became possible to reduce the scale of Allied missions against airfields to 20 per cent of the total bomber effort. After the assault phase of HUSKY, our bombers had thus been largely released from purely counter-air force operations.<sup>58</sup>

With the greater part of the air effort from D minus 7 to D-day directed against the enemy's air arm, attacks on other types of targets were confined very largely to raids by night bombers and fighter-bombers. Wellingtons attacked the ports of Cagliari and Olbia in Sardinia and Palermo and Trapani in Sicily, while A-36's of the 27th Fighter-Bomber Group bombed and strafed supply centers in southern and central Sicily. Liberators of the Ninth, in executing the relatively few attacks made by heavies on ports and other LOC targets, hit Messina, Catania, and Taormina hard, the attack on the latter being directed in part against an enemy headquarters. Other activities of NAAF's combat planes included strafing raids, offensive sweeps, convoy protection, and a not too successful attempt to put German radar stations out of action by bombing and strafing.<sup>59</sup>

Enemy opposition to Allied air operations during the intensive pre-invasion period was spotty. Some attacks met strong and persistent opposition, while others met almost none. For example, B-17's over Gerbini on 5 July were intercepted by more than 100 aggressive fighters; but a short while afterwards a second force of B-17's and B-25's saw no enemy planes. Apparently, the enemy was so short of crews and planes that he had to pick his spots. Offensively, the Axis air forces carried out only one raid, although reconnaissance was maintained on a normal scale. Allied scores indicated that throughout the pre-HUSKY operations the enemy had lost in combat a total of 250 planes against Anglo-American losses of 70 aircraft.<sup>60</sup>

The experience of the Northwest African Photographic Reconnaissance Wing through the period extending from 15 May to 10 July had more than justified the prediction of the air plan for HUSKY that the tasks of NAPRW would be "continuous and exacting." The wing flew in all over 500 missions in preparation for the invasion. Not more

than one in ten was accomplished without interception, and in addition flak was usually encountered. Nevertheless, NAPRW mapped the entire 10,000 square miles of Sicily, and made available many special photographs and reports required for planning purposes. Naval forces required photographs of virtually every port in the western and central Mediterranean, a demand met by covering daily the more important ports from Gibraltar to a line Corfu-Tripoli—by photographing twice a day those ports in which units of the Italian fleet were located—and by visiting at least once a week the smaller ports used only by coastal craft. The air forces demanded coverage of all airdromes in an area which included Sicily, Sardinia, Corsica, Italy, and the western Balkans. Once a week the reconnaissance squadrons photographed within the limits of a four-hour period all airfields in order to get an exact reading on the location of enemy planes at a given time. In addition, NAPRW provided special coverage of harbors, industrial areas, and lines of communication to meet the need for target data for the heavy bombers.<sup>61</sup>

Coastal Air Force, predominantly British in composition, had carried an equally varied responsibility. It escorted convoys through the Mediterranean, and so thorough was its cover that enemy planes made few attempts to attack Allied shipping. The major enemy effort came on 26 June when over 100 Ju-88's, FW-109's, and Cant.Z-1007's attacked an eastbound convoy off Cap Bon. Coastal's fighters destroyed six of the enemy's planes and so interfered with his operations that no vessel suffered serious damage. During the nine days preceding 10 July, NACAF's aircraft flew 1,426 sorties on convoy escort duty alone. They protected Allied harbors, against which the enemy directed most of his offensive effort during June and July. With every port from Oran to the border of Tripoli laden with shipping for HUSKY, the enemy attempted to strike at these lucrative targets in a series of night attacks, but Coastal's fighters handled the raids so effectively that not a single ship was sunk and only one was damaged. NACAF also collaborated with naval forces in the protection of shipping against submarines. Losses to the enemy were extraordinarily low, only nine ships being sunk between 1 April and 10 July.

Nor were Coastal's operations confined to defensive measures. Around the middle of June it was given a bomber unit, consisting of three day-torpedo Beaufighter squadrons, one night-torpedo Wellington squadron, a U.S. B-26 squadron, and a flight of reconnaissance planes. Placed under RAF 328 Wing, the force received orders to

watch the Italian fleet, harass shipping, and interfere with the efforts of the enemy to reinforce his insular holdings in the central Mediterranean. The unit promptly went into action, and between 18 June and 10 July sank or damaged a dozen ships ranging from armed trawlers to a 4,000-ton merchant vessel. As a final duty, Coastal flew an average of eight air-sea rescue sorties per day during the preparatory phase.<sup>62</sup>

By the end of D minus 1 (9 July), then, the Allied air forces had cleared the way for the invasion of Sicily. The enemy's air arm had been driven from the island or largely pinned down on battered fields, and his lines of supply and reinforcement had been so hammered that the normal flow of materiel and personnel was seriously retarded. With superiority in the air established, NAAF and the Ninth Air Force stood ready to assume the additional duties the actual invasion would impose upon them.

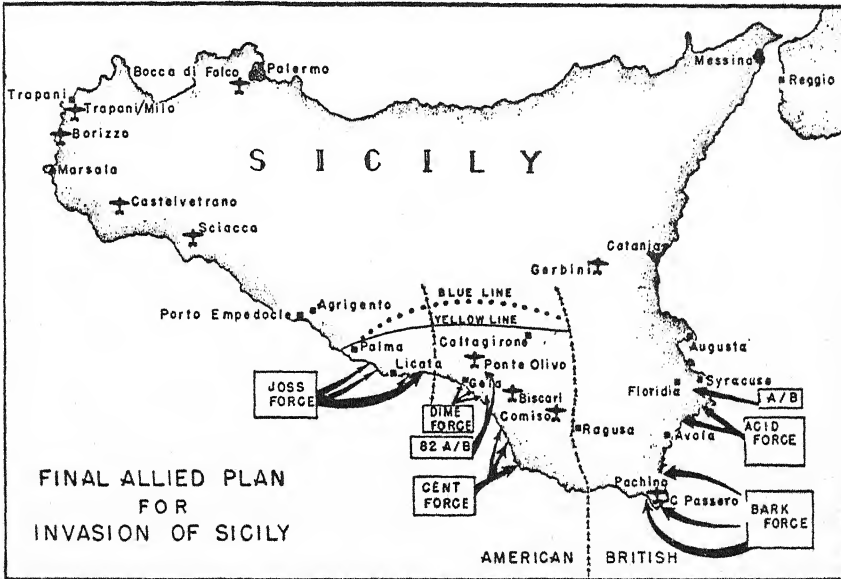
### *The HUSKY Plan*

The final outline plan for the invasion of Sicily which had been approved by the CCS on 13 May 1943 involved a reallocation of objectives between the Eastern (British) and Western (U.S.) task forces and completely changed the original logistical plan which had been based on the early utilization of the port facilities at Palermo. It did not, however, affect the broad plans for the allocation of resources to the two task forces nor alter the original basic scheme for combined land, sea, and air operations, except that the objectives of several airborne missions, which in the earlier plans had been beach defenses, were changed to strategic inland points whose capture would facilitate the advance of the ground forces.

Specifically, the plan called for eight simultaneous seaborne assaults to be made along approximately 100 miles of coast line extending from Cap Murro di Porco (just below Syracuse) around the southeastern tip of the island and westward as far as Licata.\* The British Eighth Army under command of Gen. Sir Bernard L. Montgomery was to land on the eastern coast. Its ACID Force would go ashore between, and drive toward, Syracuse and Avola; BARK Force would invade at three points around the southeasternmost tip of the island, with Pachino and its airfield the immediate objective. The American troops were divided into three assault forces: DIME, CENT, and JOSS. The DIME-

\* The area of Sicily is around 10,000 square miles. Its terrain is characterized chiefly by mountains which rise to their greatest height in the northeast. The coastal strip is narrow and the only plain of any size is to the west and south of Catania.

CENT assault, under command of Lt. Gen. Omar N. Bradley of II Corps, was to land in the Gela-Sampieri area; capture the airfields at Ponte Olivo by daylight of D plus 1, the field north of Comiso by daylight, and the field north of Biscari by dark of D plus 2, in order to extend its beachhead inland to "Yellow Line"; and make contact with the British near Ragusa. The JOSS assault, under Maj. Gen. Lucian K. Truscott, Jr., was to land in the Licata area, capture the port and airfield on D-day, protect the left flank of the invasion forces against in-



terference from the northwest, and on the right flank gain contact with II Corps.<sup>63</sup>

NAAF carried the lion's share of the responsibility for supporting air operations.<sup>64</sup> It was to provide close cooperation for the assault forces and to launch the paratroop attacks. Assisted by units of Middle East and Malta it was to destroy or neutralize enemy air forces within range of the invasion area, protect naval operations and the assault convoys, attack enemy shipping and naval forces, and defend Northwest Africa and captured areas in Sicily against air attack. With other air forces in the Mediterranean, and those in the United Kingdom, it would share in the execution of plans for cover and diversion. It was expected that after D plus 3, NAAF's many and varied duties would be



made easier by the capture of enemy airfields in southern and south-eastern Sicily from which up to thirty-three and a half squadrons of Allied planes could operate.<sup>65</sup>

In order to exploit to the fullest the inherent flexibility of air power, as well as to assure a high degree of coordination between Strategic and Tactical during and after the invasion, the air plan provided that units of either air force might be placed under the operational control of the other for specific operations whenever the situation required it. Further, in order to coordinate tactical operations over the Eastern and Western task forces, all units based on Malta were placed under the command of the AOC RAF, Malta, who in turn was under the general direction of the commander of NATAF. This arrangement permitted the bulk of the air force to be shifted and concentrated as required by the ground situation and enemy air reaction.

Strategic, Tactical, and Coastal air forces would carry the burden of air operations during HUSKY, but to NAAF's other elements went important roles. Troop Carrier Command, in collaboration with the Army units concerned and subject to directions issued by NAAF, had developed detailed plans for the paratroop and glider operations and had trained the troop carrier units which were to participate. After the initial paratroop operations, the command would transport equipment and supplies to Sicily and evacuate the wounded.<sup>66</sup>

Few if any activities outranked in importance the diversified obligations carried by Air Service Command. Through preceding weeks it had distributed the equipment necessary to bring NAAF combat units up to full strength, it had constructed and kept in repair the airfields from which the planes operated, it had kept the planes in repair and provided for them standard maintenance, for troop carrier units it had assembled hundreds of gliders for use in the paratroop drops, it had provided and trained service units for movement to Sicily with the air task force which was to follow the infantry ashore, and withal it had been responsible for the accumulation and disposition of the vast quantities of expendable stores and spares required by an air force heavily committed against the enemy. After D-day it had the task of insuring the delivery of all necessary supplies and stores to air units moving forward to fields in Sicily. It would establish in Sicily as soon as possible the normal supply and maintenance service for the USAAF units.

Elements of the service command would go ashore on the heels of the first assault troops, and, as soon as the beachheads had been made

secure, additional units would be landed. During and after D-day the command would provide "housekeeping" and the many other prosaic but indispensable services which were its routine duties. Routine as they may have been, combat operations were fully dependent upon them.

Normal channels of supply for the air task force could not be employed during the assault phase of HUSKY, so special arrangements—outlined in an air administrative plan—had been made for the provision of such expendable items as gasoline, bombs, small-arms ammunition, and oxygen. Basically, the plan was to ship a few stocks with the initial air force ground parties and to build up thereafter by means of later shipments. To keep losses at a minimum the stocks sent with the assault convoys would be small and distributed among several ships. Thus, the loss of one or two ships would not immobilize air operations from the island, but the plan had the disadvantage of scattering supplies along miles of beaches.<sup>67</sup>

It should be noted that the air plan dealt for the most part with broad policies and that it had not been integrated in detail with ground and naval plans. This was deliberate, and the result of sound strategic and tactical considerations emphasized by experience in the Tunisian and Western Desert campaigns. There would be no parceling out of air strength to individual landings or sectors. Instead, it would be kept united under an over-all command in order to assure in its employment the greatest possible flexibility. It would be thrown in full force where it was needed, and not kept immobilized where it was not needed. Too, the chief immediate task of the air arm was to neutralize the enemy air force, a fluid target not easily pinpointed in advance.<sup>68</sup>

As the invasion convoys steamed toward Sicily on the night of 9/10 July, the Allied air forces numbered approximately 4,900 operational aircraft of all types, combat and noncombat, divided among 146 American and 113.5 British squadrons.\*<sup>69</sup> The German and Italian air forces opposing them were estimated to have between 1,500 and 1,600 aircraft based in Sicily, Sardinia, Italy, and southern France. The advantage indicated by these figures was better than 3 to 1, but the advantage in combat aircraft was nearer 2 to 1. It was not too great a margin for the tasks that lay ahead.

\* American units made up most of the bomber and air transport force and about one-third of the fighter contingent; the RAF provided a majority of the single- and twin-engine fighters and coastal aircraft and the entire night bomber force.

## CHAPTER 14

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### *CONQUEST OF SICILY*

THE final assault on Sicily opened with the first large-scale airborne operations undertaken by the Allies in World War II. Two missions had been scheduled for the hours immediately preceding H-hour at 0245 on 10 July: one, coded LADBROKE, a drop in the neighborhood of Syracuse for the purpose of seizing the canal bridge south of that city to facilitate the advance of the British Eighth Army; the other, HUSKY No. 1, a drop near Farello for capture of the high ground and a road junction six miles east of Gela, a position which commanded the exits from beaches over which the American 1st Division would storm ashore in the next few hours. For each of the two missions a complicated, dog-leg course had been charted, running east from Tunisia to Malta and thence northward to Sicily—a route fixed in part by the necessity of avoiding friendly naval vessels whose orders were to fire on any aircraft in their vicinity and in part by the requirement that the planes maintain radio silence, which made visual aids to navigation essential. In LADBROKE the paratroopers would land by glider, in HUSKY No. 1 they would drop by parachute from troop carrier planes.<sup>1</sup>

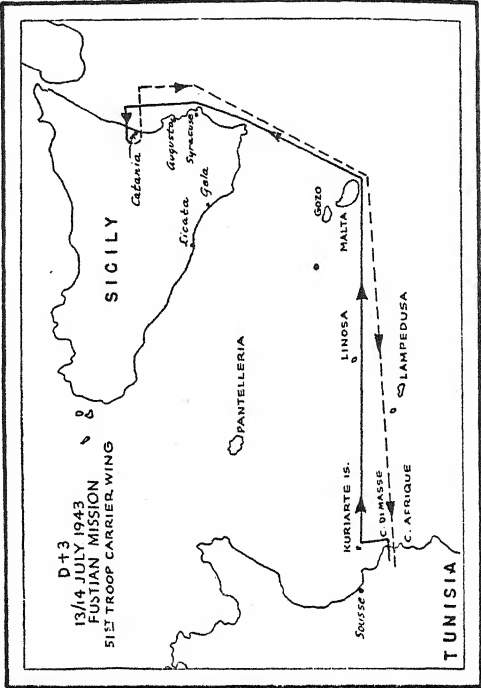
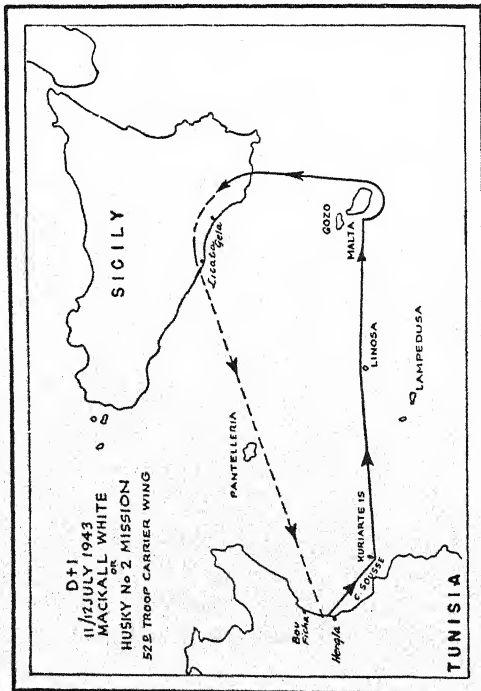
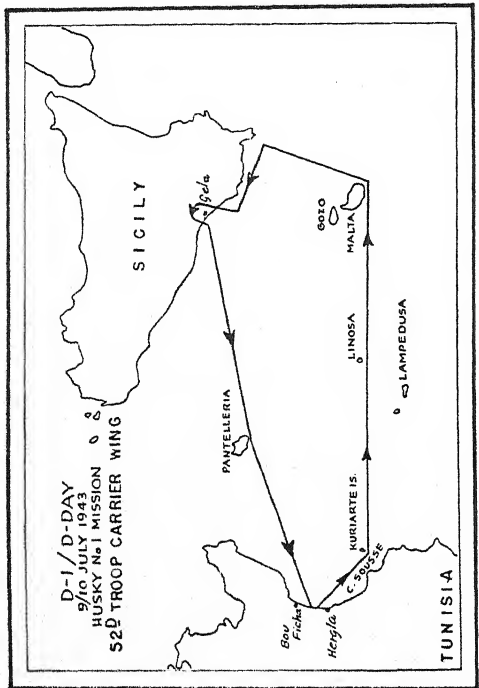
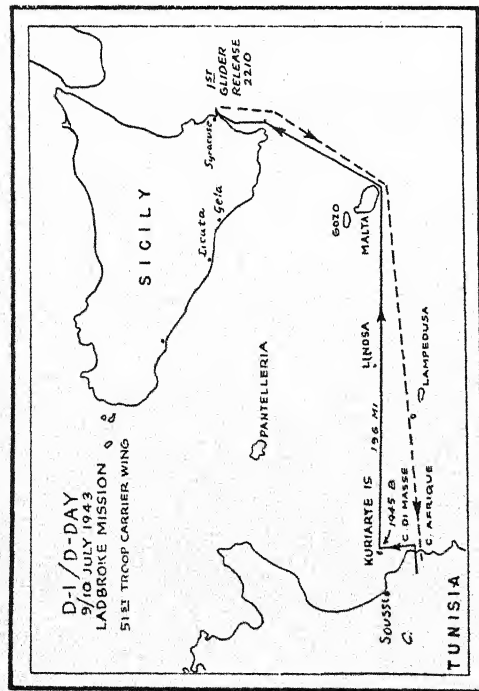
LADBROKE got under way at approximately 1800 on 9 July (D minus 1) when 147 tow planes began to take off from fields in the El Djem area of Tunisia, each plane pulling a loaded glider behind it. All but 35 of the planes were American C-47's belonging to the 51st Wing of NAAF Troop Carrier Command;\* except for eight British Horsas all of the gliders were American-made Wacos, but all gliders were manned by British pilots and the more than 1,600 paratroopers they carried were members of the British 1 Airborne Division. The forma-

\* NAAFTCC was under General Williams. The 51st Wing was commanded by Brig. Gen. Ray A. Dunn, and the 52d by Col. Harold L. Clark.

tions flew until darkness under fighter cover furnished by planes of the 1st Air Defense Wing. No enemy aircraft were encountered. A strong wind which had come up during the afternoon added to the difficulty of staying on course, and most of the planes, having drifted southward, missed the first check point on Malta. Corrections were made, however, and the planes were on course as they approached Cape Passero in southeastern Sicily.

After passing that point, they climbed to a release altitude of 500 feet for the Horsas and 3,500 feet for the Waco gliders. Some pilots, noting the velocity of the wind, went as high as 3,000 feet before signaling for the release of their gliders. Flak at several points along the coast caused many pilots to swing wide from the fire and thus to get off course. There was no fire within several thousand yards of the two release zones, one just south of Syracuse and the other over its western suburbs on the road to Floridia, and the enemy attempted no interceptions. But with the wind high and some of the planes obliged because of poor visibility to make two or three passes, the release areas became congested. Contributing further to the generally poor execution which characterized the mission was the inadequate training of the glider pilots, some of whom had not advanced beyond the first solo stage of instruction at the time of their arrival in Africa with only three weeks left for TCC to train them in navigation and night flying. Some of the glider pilots released before receiving the signal from the tow pilot. Some, unfamiliar with the American-built Wacos, on release turned their gliders in a reverse direction from the proper course. Not a single tow plane was lost, but of the 133 gliders released only 12 landed in the general vicinity of the landing zone, at least 65 came down in the sea, and the remainder landed at various points in the southeastern part of the island.

Poorly executed as it was, the mission nevertheless served a useful purpose. The eight officers and sixty-five enlisted men who came down in the drop zone (DZ) reached the canal bridge south of Syracuse and held it long enough for advance patrols of the ground troops to arrive; then the glider troops defended the bridge while a brigade of the British 5 Division moved across. Even the troops who landed far from the DZ contributed heavily to the success of the initial ground force operations. Widely scattered and groping about in the dark, they attacked such of the enemy's positions as they could find and thereby added to the confusion and disorganization of his defenses and reserves.<sup>2</sup>



AIRBORNE OPERATIONS, HUSKY

HUSKY No. 1, the American paratroop operation, in many respects closely paralleled LADBROKE. The 226 C-47's, carrying 3,405 paratroopers of the U.S. 82d Airborne Division and 891 parapacks, assembled over the Kairouan area soon after 1800 hours on the 9th and flew under fighter protection until darkness. They too, and again because of the wind, missed the check point at Malta. Continued high winds, together with navigational difficulties along a complicated course running from Malta north to Sicily, west to below Gela, and then north to the drop zones, caused such delay that the planes approached the drop zones in almost complete darkness and were unable to pick out the final check points. Fires and smoke resulting from earlier bombardment by Allied planes further obscured the drop zones, and the paratroopers were dropped over widely scattered areas. Even so, enough of them landed near the objective to carry out the primary mission of seizing the high ground and road junction east of Gela, and they held the position. Others, who landed beyond the easternmost point of the American ground forces, captured the town of Marina di Ragusa and soon made contact with the U.S. 45th Division. The aggressive action of the paratroopers, together with the surprise of an enemy who apparently had not anticipated large-scale airborne operations, adversely affected the morale of the Italian soldiers, some of whom withdrew as much as ten miles.<sup>3</sup>

Both LADBROKE and HUSKY No. 1 were accompanied by diversions. B-17's, especially fitted with devices to obstruct enemy RDF, were over Sicily during the operations. Hundreds of paratroop dummies dropped by Allied planes were believed to have added to the enemy's confusion. Diversionary bombing missions employing incendiaries also proved effective, although in HUSKY No. 1 the fires and smoke which they produced interfered with accurate dropping of the paratroopers.<sup>4</sup>

### *The Assault Phase*

The airborne operations constituted but one of a variety of responsibilities shouldered by NAAF on the eve of the amphibious assault on Sicily. To the planes of Coastal Air Force, assisted by the 33d Fighter Group from its new base on Pantelleria, had fallen the task of protecting initially the great convoy of over 3,000 vessels as it moved with the assault forces toward Sicily. Within a radius of fifty miles from Malta the responsibility passed to the planes of that island, which included a



part of the U.S. 79th Fighter Group. The 31st Fighter Group on nearby Gozo also shared in the effort. That the enemy attempted no air attack on the convoy detracts nothing from the precision and skill with which the covering mission was executed. Admiral Hewitt, who commanded the Western Naval Task Force, regarded the air force coverage of the convoys as "the most carefully planned and most successfully executed" phase of HUSKY.<sup>5</sup>

As the assault forces approached Sicily, the USAAF and the RAF smashed hard at the enemy and his installations in immediate preparation for the landings. Twelfth Air Force planes during the closing daylight hours of D minus 1 undertook in repeated bombing attacks to soften resistance at and adjacent to the beaches, to prevent the movement of enemy reserves to the threatened areas, and to pin down German and Italian aircraft. Wellingtons, Halifaxes, and Liberators of the RAF through the night hours struck at a variety of targets in southeastern Sicily, most of them in the Syracuse area. With daylight, B-17's and B-25's took over again to hit the Gerbini, Trapani/Milo, and Sciacca airfields and also the town of Palazzolo ahead of the Eighth Army. In addition, P-38's swept over the western and southeastern parts of the island on strafing missions.<sup>6</sup>

Meanwhile, the assault waves had started ashore under the protection of naval gunfire, most of them on schedule or not more than a few minutes behind, with the exception of the 45th Division whose landing was delayed a full hour. From east to west the American subtask forces of the Western Task Force hit the beaches as follows: \* CENT (45th Division) on the right flank from Scoglitti to Fiume Agata; DIME (1st Division less the 18th RCT) between Fiume Agata and Gela, with the Ranger Force assaulting Gela frontally; JOSS (chiefly the 3d Division plus CCA of the 2d Armored Division) from six miles east to six miles west of Licata. All of the forces achieved a large degree of tactical surprise owing, apparently, to a combination of carefully controlled security, a good cover plan well executed by the air forces, and Coastal's success in shooting down enemy reconnaissance planes. By 0600 hours all landings had been successfully completed. Once ashore the troops made good progress throughout the day.<sup>7</sup>

At daylight, fighter planes had established defensive patrols over the beaches and shipping. It had been expected that the enemy would endeavor to throw the full force of his available air power against the

\* See map, p. 443.

beaches and offshore shipping on D-day, but the Allies did not have enough fighter strength to maintain continuous cover over all beaches during the sixteen hours of daylight. Although there were enough fighters present in the theater, several factors limited their full employment: the operational capacity of the fields on Malta and Pantelleria, the long distance from the bases there to the assault areas and the resulting short time which each sortie could give to flying cover, and the heavy commitments to fighter escort for bombing missions. Consequently, the air forces could provide continuous fighter cover throughout the day only over two of the beaches. But all beaches would receive continuous protection for the first two and the last one and one-half hours of daylight and, in addition, from 1030 to 1230 and 1600 to 1730 hours. A fighter wing also was held in reserve to reinforce any area where special assistance might be required.

In accordance with this plan, five RAF Spitfire squadrons from Malta provided protection during the stipulated hours over the ACID, BARK, and CENT beaches, the U.S. 31st Group from Gozo covered DIME, and the U.S. 33d Group from Pantelleria took care of JOSS. All of these units operated under the control of the AOC Malta, but XII Air Support Command (Advanced), through its fighter-director units on the USS *Monrovia*, gave forward direction via VHF/RT in the DIME and JOSS areas and over the CENT area through similar units on the USS *Ancon*. The director units lacked combat experience and adequate training as a team. Moreover, plans for fighter protection of the assault areas had not been completed until after the convoys were at sea. Even so, in Admiral Hewitt's opinion, they turned in a most creditable performance.<sup>8</sup>

Later, there would arise the usual differences of opinion between the U.S. Navy and the air forces as to the effectiveness of the air cover. The Navy insisted that close support by aircraft in amphibious operations, as understood by the Navy, did not exist. In support of that categorical statement it pointed out that the average number of fighters maintained over the American beaches was approximately ten; that on two occasions there were no fighters in any of the areas and on several other occasions no cover over one or two areas; and that because of the limited number of planes available, patrols had been maintained at only one level. NAAF, on the contrary, presented strong arguments in support of its view that the cover had been effective. Not only had its Spitfires and P-40's flown 1,092 sorties on D-day but, in contrast to the

Navy's anticipated loss of up to 300 ships during D minus 1 and D-day, there stood the actual loss to enemy air action of only twelve vessels. To the airmen that record acquired additional significance in view of two facts: fire from friendly ships had forced Allied fighter patrols up from 5,000 and 8,000 feet to 10,000 and 14,000 feet with a consequently increased danger of enemy aircraft breaking through, and many ships had been anchored so far from shore (up to six miles) that our fighters had found it difficult to cover simultaneously ships, landing craft, and beaches. NAAF's side of the disagreement received strong support from the Admiralty, whose "Battle Summary of the Invasion of Sicily" stated that casualties to shipping in the several invasion areas were considerably less than had been anticipated. According to Adm. Sir B. H. Ramsay this was the result of a very high degree of air superiority which resulted in a "surprising" immunity from air attack. Additional evidence of the effectiveness of the air cover came from Admiral Cunningham, Commander in Chief, Mediterranean, who called the number of Allied fighter sorties "prodigious" and who declared that the navies and armies "owed a great debt to the air for the effectiveness of the protection offered them throughout the operation." To the admiral it seemed "almost magical that great fleets of ships could remain anchored on the enemy's coast."<sup>9</sup>

After the outline air plan had been agreed upon but before the invasion was launched, it had become evident that the rate of disembarkation of supporting arms for the land forces might not be sufficiently rapid to assure the security of the beachheads. Consequently, the air forces undertook a special effort toward interdiction of the enemy's movements from the interior toward the assault areas. They met the new commitment by temporarily transferring two groups of U.S. P-38 fighter-bombers from Strategic Air Force to reinforce the two U.S. A-36 groups of Tactical. The P-38's were assigned to the eastern area and the A-36's to the western and central area, with orders to attack all movement. Formations dispatched every thirty minutes throughout D-day destroyed many enemy transports. Especially effective were attacks delivered along the eastern coastal road and the roads radiating from the Axis concentration area around Enna in central Sicily.

The Allied ground troops met little effective opposition from the Italian forces defending the beaches, and by the end of D-day they had secured all beachheads in both the American and British sectors and had captured Licata, Syracuse, and the landing field at Pachino. On the

11th, the Germans in a sharp reaction launched a major effort to drive the Americans back into the sea. The assault fell hardest on the 1st Division, holding the center of the line, near Gela. Hard fighting stopped the attack, as it did a second major effort on the 12th, after which the Allies promptly took the offensive. By midnight of 12/13 July the Seventh Army had captured Comiso, Ragusa, and Ponte Olivo, the British had seized Noto, Avola, and Augusta, and the two armies were in contact. The critical phase of the assault was over.<sup>10</sup>

During the crucial fighting of the 11th and 12th, the air forces had steadily increased their rate of effort against enemy movements. Almost 1,000 sorties flown by Twelfth Air Force day fighters and fighter-bombers on the 12th left the roads of Sicily blocked with burned trucks, seriously hampered the enemy's road movements, and helped the Allied ground forces to strengthen and enlarge their beachheads. Concurrently, regular and strong defensive air patrols continued to be maintained over the beaches and shipping (cover was continuous over CENT, ACID, and BARK), with NATAF's fighters shooting down fifty-two enemy planes. On 10, 11, and 12 July, Desert Air Force flew more than 3,000 sorties, of which the attached 31st and 33d U.S. Fighter Groups accounted for more than 1,000. Most of the planes flew three sorties a day.<sup>11</sup>

In an attempt to send assistance to hard pressed Allied troops around Gela a third airborne mission (HUSKY No. 2) had been flown on the night of 11 July. The 52d Troop Carrier Wing provided 144 C-47's which took off from Tunisian fields with approximately 2,000 paratroopers of the 504th Regimental Combat Team. Taking the same complicated course previously traveled by HUSKY No. 1, the mission faced the additional hazard of traversing the actual battlefield for a distance of some thirty-five miles. It faced, too, equal if less well-understood dangers. For the decision to mount the operation had been made hurriedly on the very day of its execution, and insufficient time had been allowed for warning Allied naval vessels along the route. Only too late was it learned that a safety corridor had not been cleared and that the enemy had retaken the drop zone at the Gela/Farello airport.

Allied naval and merchant vessels brought heavy fire to bear on the planes as they approached Sicily. Near Marina di Ragusa shore batteries opened fire, and with both friend and foe combining their efforts the corridor of approach to the drop zone "became alive with deadly machine gun fire and heavy flak." Over the DZ some of the pilots refused

to drop, feeling that it would be murderous to do so; other pilots, their formations having been broken by the intense fire, scattered the paratroopers from Gela to the east coast. And then, as if to add a full measure, some of the returning planes remained under fire for as much as twenty miles after they left Sicily.

Losses were heavy. Twenty-three aircraft failed to return and over half of those which did reach home were badly damaged. Nor were the paratroopers able to accomplish their mission. Their unheralded descent at widely scattered points caused confusion: Allied troops were alerted against German parachutists—the 1st Division even carried the 504th RCT as an unidentified enemy parachute regiment in its G-2 report—and there were encounters between Allied airborne and ground troops. As a result the 504th suffered heavy casualties which General Eisenhower considered to be “in excess of any real damage inflicted on the enemy.” On 14 July the 504th and 505th were assembled near Gela, reinforced by an infantry RCT, and assigned artillery support, and thereafter they acted as an infantry unit on the extreme left of the American sector.<sup>12</sup>

Despite the unhappy experience with HUSKY No. 2, it was decided to attempt one more large-scale airborne operation. Flown on the night of 13 July and coded FUSTIAN, it had the objective of taking Primasole bridge over the Simetó River north of Lentini which provided the only good exit for the British forces from the high ground into the Catania plain. Again, the mission was set up late, the safety corridor was not properly cleared (although Troop Carrier had every reason to believe that it had been), and the planes ran into heavy fire from Allied naval vessels as well as from friendly and hostile shore batteries. Of the 132 aircraft which sortied, 50 were damaged and 14 destroyed by enemy and friendly fire, while another 27 were forced by flak to return to base with full or partial loads. Even so, the British paratroops dropped close enough to the objective to seize the bridge, remove its demolition charges, and hold on until the ground forces took possession on the morning of the 14th.<sup>13</sup>

Four small missions intended to harass enemy lines of communication in northeastern Sicily completed the airborne operations of HUSKY.\*<sup>14</sup>

\* All of these missions were flown by British Albemarle of the 51st TCW. In CHESTNUT No. 1 (12 July), one of the two planes dispatched carried out its mission; in CHESTNUT No. 2 (13 July), neither plane completed its mission; in CHESTNUT No. 3 (14 July), both planes were successful; in CHESTNUT No. 4 (19 July), the one plane dispatched did not accomplish its purpose.

In retrospect, three of the four major airborne operations could be regarded as tactically successful. General Patton declared that the action of the 82d Airborne Division near Gela on D-day had speeded up the advance of his Seventh Army by at least forty-eight hours. General Alexander said that the early capture of Syracuse was "largely due" to the airborne troops, while Montgomery estimated that airborne troops dropped in front of the Eighth Army had accelerated its advance by as much as a week.<sup>15</sup> The total loss in planes of forty-five aircraft out of the 666 troop carrier sorties flown, even when allowance is made for the heavy damage sustained by many other planes, was perhaps not too high a price to pay for these accomplishments. But there was cause for serious dissatisfaction in the fact that perhaps twenty-five of the forty-five aircraft lost had been shot down by friendly naval and ground fire and that some 60 per cent of the 5,000 paratroopers carried had landed far from their drop zones. Whatever the tactical success achieved on three of the missions, the remaining one had ended in complete failure and none of the missions had been satisfactory from a technical or operational point of view.

Coningham felt that the operations had been handled rather amateurishly, that they had been a "soldier's air operation" rather than an airman's. Spaatz, writing to General Arnold immediately after FUSTIAN, declared that the missions had demonstrated that parachute and glider operations could be conducted without excessive losses only if surprise were obtained, that airborne troops could not be dropped into an organized battle position without incurring heavy losses, and that mutual training in identification must be thorough.<sup>16</sup> General Eisenhower was in full agreement with Spaatz and, as soon as possible after the invasion of Sicily, he took steps to review the airborne missions in order that the experiences and lessons might be put to use in future operations. Staff officers of Troop Carrier Command and of airborne headquarters prepared critiques covering various phases of the problem, and on 23 July, Eisenhower appointed a board of officers for a special study which on completion served as the basis for a training memorandum circulated to all Allied forces in the theater.

These investigations led to the conclusion that airborne troops should be employed only on missions suited to their role, and then only when the task could not be accomplished "by other means more economical or equally well suited to the mission." All ground and naval forces should be notified of planned operations well in advance, twelve hours being considered a desirable minimum. The final decision as to

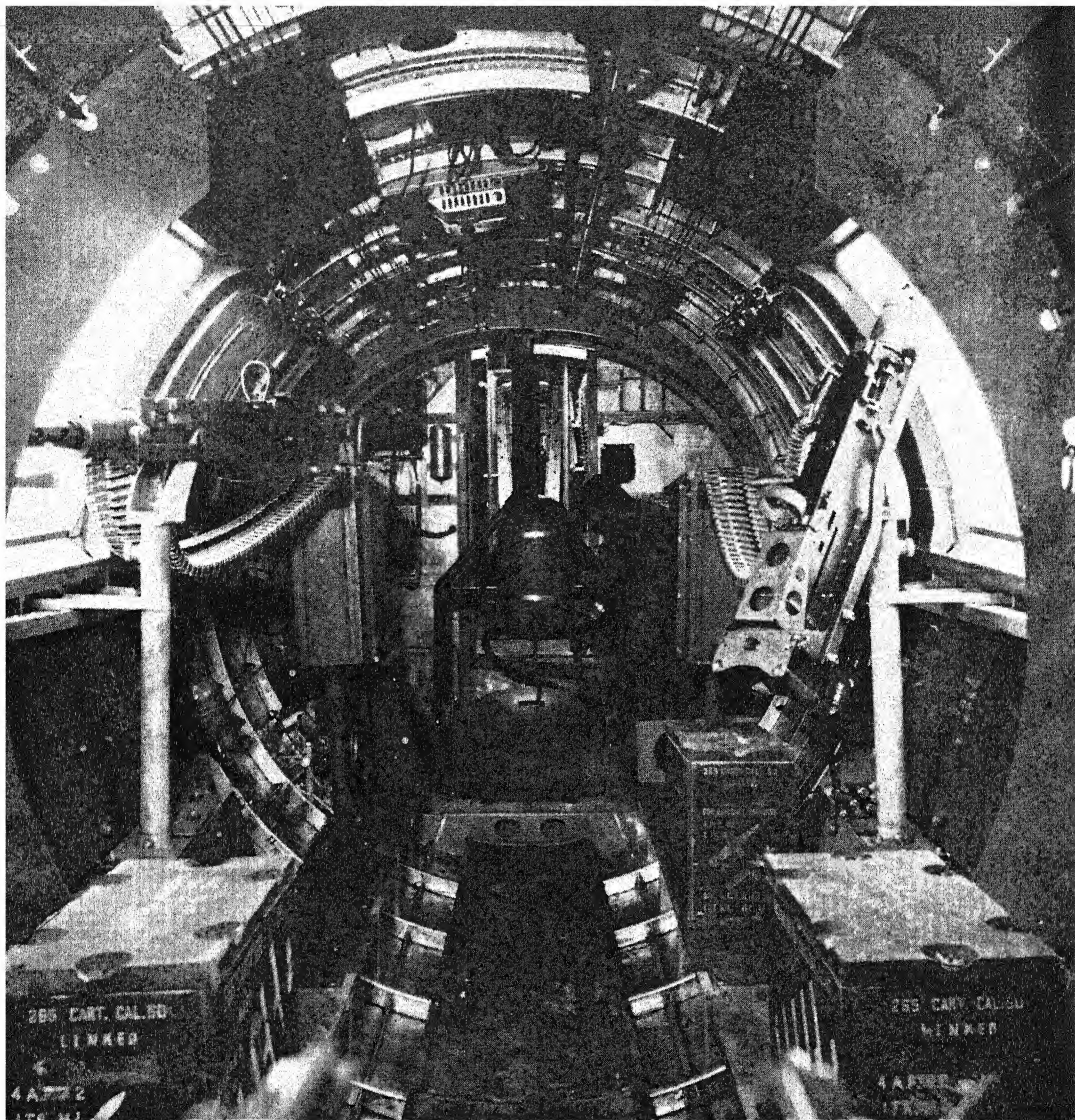


whether an operation should be carried out must rest with the air commander in chief, since every feature of the mission—such as fighter protection and routing—was an air matter until after the drop had been made. Planning should be centralized in one headquarters; and the carrying agency should be under the direct control of the air commander in chief in order to simplify problems of command and communications. In planning all airborne missions involving overwater flights, provision must be made for keeping surface vessels as far as possible out of a safety corridor of approximately five miles on either side of the route of flight. At the same time, however, aircrews must be warned of the great vulnerability of surface vessels to air attack and made to realize that naval vessels could not afford to accept the presence of aircraft in their vicinity unless the planes positively identified themselves as friendly. Finally, realistic and thorough training for air force and airborne troops in combination was required, with special attention given to training in low-level navigation at night and to the proper use of recognition signals. Where possible, the preparatory training should culminate in a rehearsal of the operation under conditions simulating the actual battle situation.<sup>17</sup> If these conclusions gave emphasis to the basic faults in the execution of the HUSKY missions, they also pointed the way to the highly successful airborne operations later to be staged in the invasions of Italy and Normandy.

In other activities, the record showed a much more favorable balance. During the first three days of the invasion Allied fighters, which flew approximately ten times as many sorties over the battle area as did the enemy, had been conspicuously successful in air battles. Counting all types of tactical operations, they shot down some eighty-five enemy fighters and claimed almost as many more probably destroyed or damaged against the loss of around forty planes. After the 12th the enemy began to reduce his day effort and by the 16th had virtually stopped daylight operations. At the same time, however, he increased the scale of his night attacks. Fortunately, the Allies were prepared to meet this development. Ground control interceptors (GCI) had been installed on LST's in the ACID, BARK, and DIME areas, and patrols of at least three night fighters from Malta were maintained constantly on fixed lines of patrol. On the first night of increased enemy action, 12/13 July, the fighters destroyed five Ju-88's, two Cant.Z-1007's, and one Do-217. By the close of the first week of the campaign, night fighters claimed the destruction of more than fifty enemy planes against the loss of only three.<sup>18</sup>

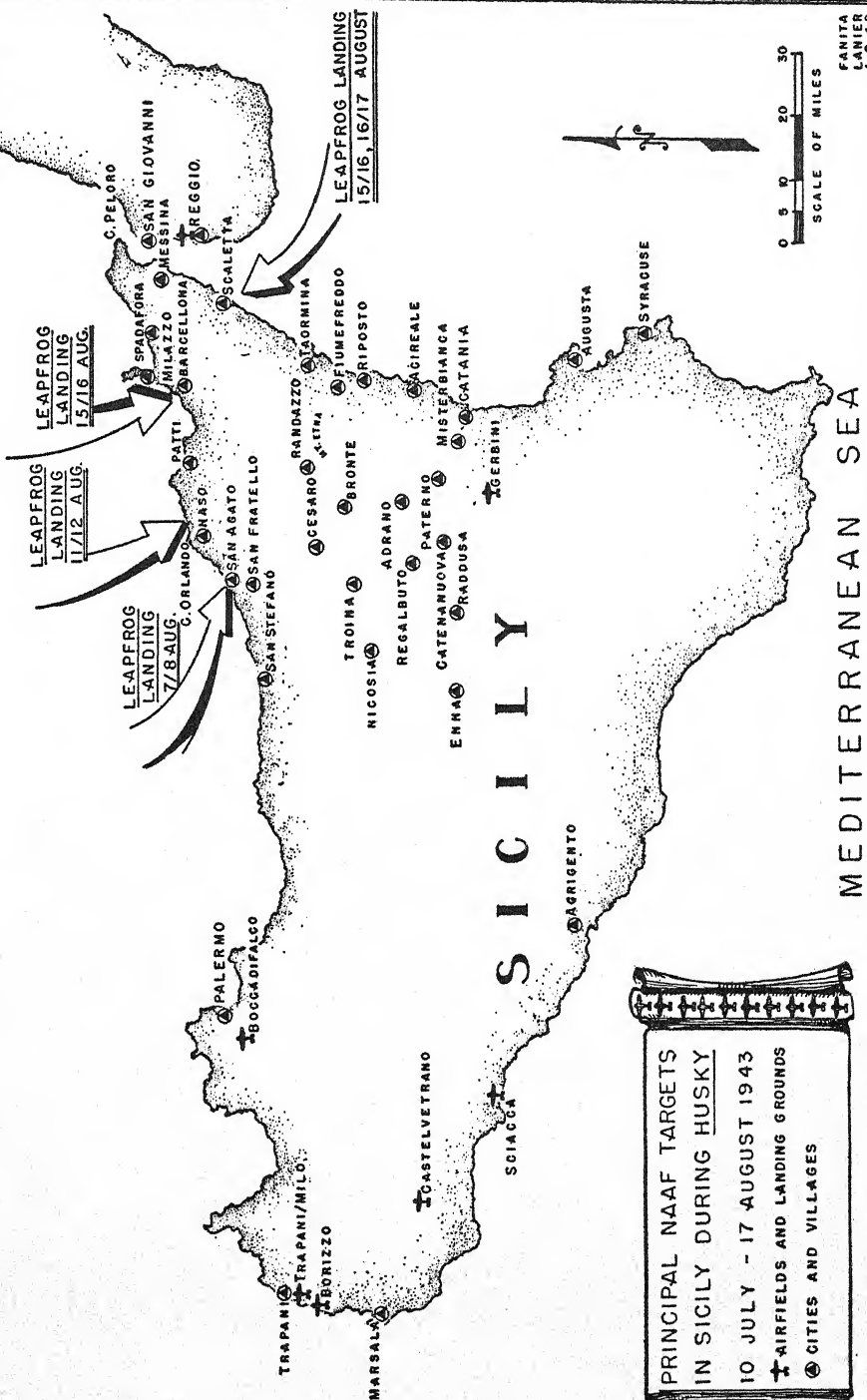


FIRST AAF ATTACK ON ROME, 19



TYRRHENIAN SEA

ITALY



PRINCIPAL NAAF TARGETS  
IN SICILY DURING HUSKY  
10 JULY - 17 AUGUST 1943  
★ AIRFIELDS AND LANDING GROUNDS  
● CITIES AND VILLAGES

MEDITERRANEAN SEA

FANITA  
LAWLER  
1.9.43

In addition to the more than 5,000 sorties flown by planes of Tactical Air Force during the assault stage, Strategic Air Force threw its full might against the enemy in an effort to neutralize his air force and prepare the way for the ground forces to advance. The main emphasis was on lines of communication and airfields. Four groups of B-17's and five of mediums of the Twelfth Air Force and five groups of B-24's of the Ninth operated almost continuously. Their heaviest attacks were directed against the following targets: Catania, whose marshalling yards, repair shops, and industrial installations were severely damaged; Reggio and San Giovanni on the Italian side of the Strait of Messina, where marshalling yards, ferry slips, and port facilities were battered; Messina and Agrigento, where lines of supply were struck; Sicilian airfields of the Gerbini complex, Sciacca, and Trapani/Milo and Italian fields at Vibo Valentia, Reggio, and Crotone.<sup>19</sup>

As a result of the combined efforts of Strategic and Tactical, the enemy's resistance in the air sharply declined, the 13th being the last day on which he was able to put up an at all effective opposition over Sicily. The Allied ground troops had effected their landings and consolidated their beachheads without serious interference from enemy aircraft. They had fought, moreover, against enemy forces denied adequate reinforcements and on occasion disorganized by Allied air attacks.<sup>20</sup> Assisted thus by the air forces, by 13 July they had seized six airfields and landing grounds which were quickly put into operation. Fighter controls went ashore on the 12th, and the next day the first fighter squadrons flew into Sicily, landing at Pachino. One week after D-day there were eighteen and a half squadrons of NAAF planes—of which seven and a half belonged to USAAF—operating from the fields at Pachino, Comiso, Ponte Olivo, and Licata. On the 18th, six more squadrons of USAAF planes reached the island, and by the 20th fighter-bomber units were present. In the first week after the 13th, lack of air service personnel to move supplies and establish dumps threatened to curtail combat operations, but Troop Carrier saved the situation by flying in fuel, ammunition, rations, and other supplies; subsequently, the construction of a pipe line from Gela to Comiso, capable of delivering 2,200 barrels of gasoline a day, further eased the supply problem. The forward movement of these fighter, fighter-bomber, and reconnaissance units from the distant bases on Tunisia, Malta, Pantelleria, and Gozo greatly facilitated the bombing, strafing,



patrol, and reconnaissance operations of Tactical Air Force as it cooperated with the ground forces in the drive into the interior.<sup>21</sup>

At the end of the first week of operations the Seventh Army had reached its initial objective, Yellow Line. The British Eighth was past Piazza Armerina in the center and Primosole on the coast. In front of the Americans the enemy was withdrawing in the general direction of the Catania plain, fighting only delaying actions; but in the British sector he was putting up strong resistance. In both areas the air forces materially aided the advance of the Allies. Aircraft of NATAF bombed and strafed enemy road movement in central and northern Sicily and transportation arteries leading from the central part of the island to the south and east. They attacked on a twenty-four-hour basis, Wellingtons and mediums supplementing at night the severe raids delivered during the day by mediums, fighters, and fighter-bombers. Beaufighters of Coastal Air Force struck at enemy shipping north of Palermo, sinking several merchant vessels.

With the beachheads established and the enemy air force unable to interfere seriously with the land battle, NAAF had been able to raise its sights from the immediate vicinity of the battlefields to targets farther afield. Messina continued to serve as a primary target; on the 14th it was struck a particularly hard blow when 212 heavies and mediums plastered it with about 800 tons of bombs. NAAF directed most of its long-range effort, however, against targets in Italy proper, whence came the bulk of men and materiel needed by the hard pressed Axis forces in Sicily. On the 14th and 15th a total of 154 B-17's and 44 Wellingtons attacked Naples, severely damaging marshalling yards and rolling stock and severing or blocking most of the tracks. Other attacks accomplished extensive damage at the supply center of San Giovanni. To prevent the build-up of enemy bomber and fighter strength, Liberators of the Ninth flew from their Cyrenaican bases to bomb Foggia and a bomber base at Bari, while B-25's and B-26's of NASAF hit the fighter base at Vibo Valentia. In the latter attack, an estimated fifty out of seventy-eight enemy aircraft present on the field were destroyed.

Thus, as the first week of the Sicilian campaign drew to its close, the Allied ground forces had occupied approximately one-third of the island, while the air forces had effectively neutralized the air resistance based there, had struck hard and effectively at enemy movement and lines of communication to the combat areas, and had carried its offensive with great power onto the mainland of Italy. During that period,



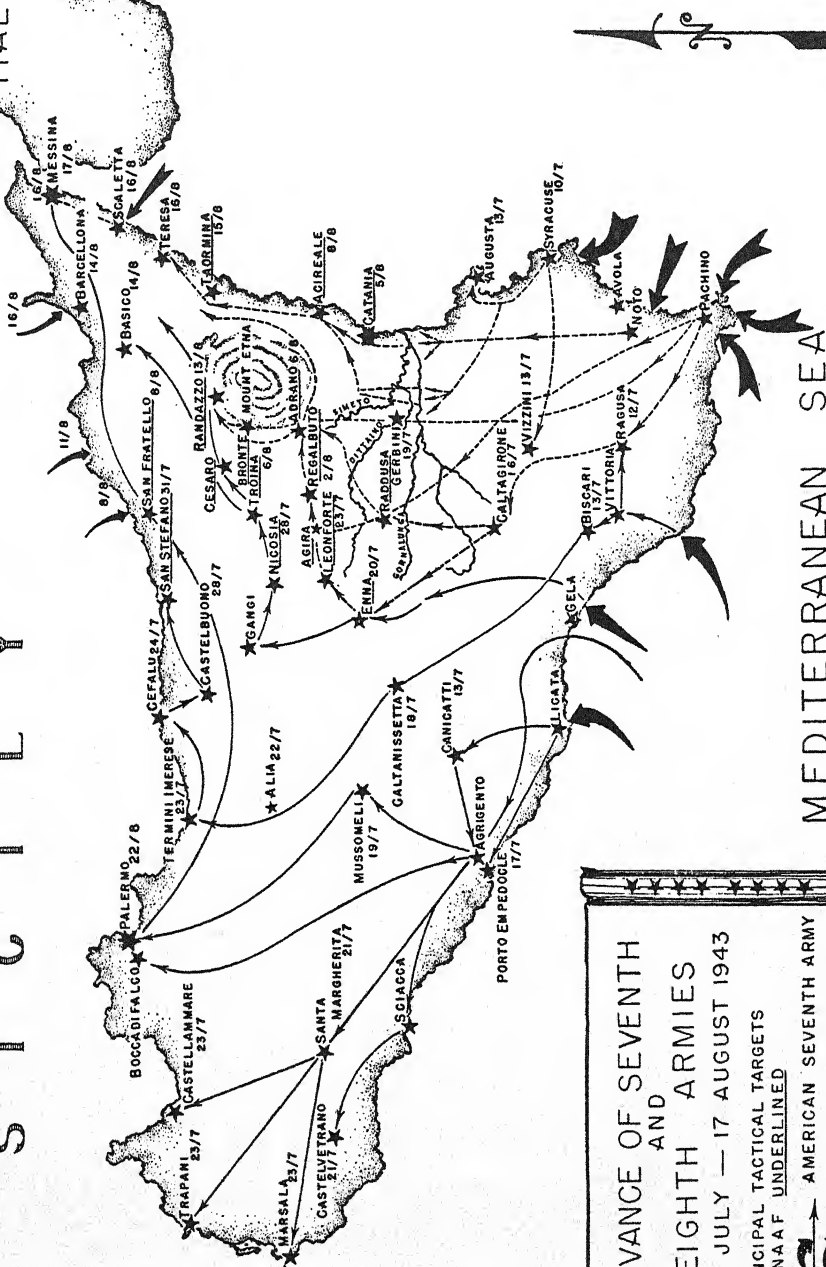
## THE ARMY AIR FORCES IN WORLD WAR II

Tactical Air Force flew 7,036 fighter and fighter-bomber sorties and 768 bomber sorties, 510 of the latter against enemy positions and lines of supply. Strategic flew 1,720 bomber sorties, of which 1,031 were against positions and lines of communication, and 827 fighter sorties. Coastal flew 1,562 sorties, four-fifths of which were on convoy escort, while coastal-type aircraft put in 487 sorties. Reconnaissance squadrons of NATAF and PRU Spitfires, NASAF P-51's, and sea reconnaissance Wellingtons and Baltimores added 315 sorties. The total for all elements was 12,715 sorties. The weight of bombs dropped came to 4,530 tons. Planes of Troop Carrier and Air Service Command added an undetermined but substantial number of sorties to the total, flying, in addition to the airborne drops, many missions which carried supplies and personnel to Sicily and which brought out hundreds of wounded and sick soldiers.<sup>22</sup>

### *Reduction of the Island, 17 July-17 August*

After the firm establishment of the beachheads and the seizure of initial objectives during the first week of the campaign, the Seventh Army drove north and west with the object of seizing the port of Palermo. Simultaneously, the Eighth Army moved to reduce Catania. The accomplishment of these missions would eliminate effective opposition in the western half of the island and permit a twin drive from Palermo eastward and from Catania northward against the Messina area. In general, XII Air Support Command cooperated with Seventh Army and Desert Air Force with Eighth, with the planes of Tactical Bomber Force divided between the two.

The Seventh Army advanced along three lines. The II Corps moved north and northwest for an attack on Palermo from the east; I Provisional Corps advanced in a northwesterly direction to approach the city from the south and southwest; the 2d Armored Division followed I Provisional Corps in readiness to exploit a breakthrough or to extend the envelopment to the west. The advance started slowly on the 17th against stiff opposition and local counterattacks, but by the 19th the three prongs of the enveloping movement were gathering momentum. On the 20th the 3d Division moved beyond Mussomeli; the 82d Airborne Division took Sciacca on the southwest coast; and the 1st Division captured the important supply base of Enna. The swift seizure of Enna offered a striking commentary on modern warfare: in the early



# ADVANCE OF SEVENTH AND EIGHTH ARMIES

10 JULY — 17 AUGUST 1943

# PRINCIPAL TACTICAL TARGETS OF NAAF UNDERLINED

AMERICAN SEVENTH ARMY  
BRITISH EIGHTH ARMY

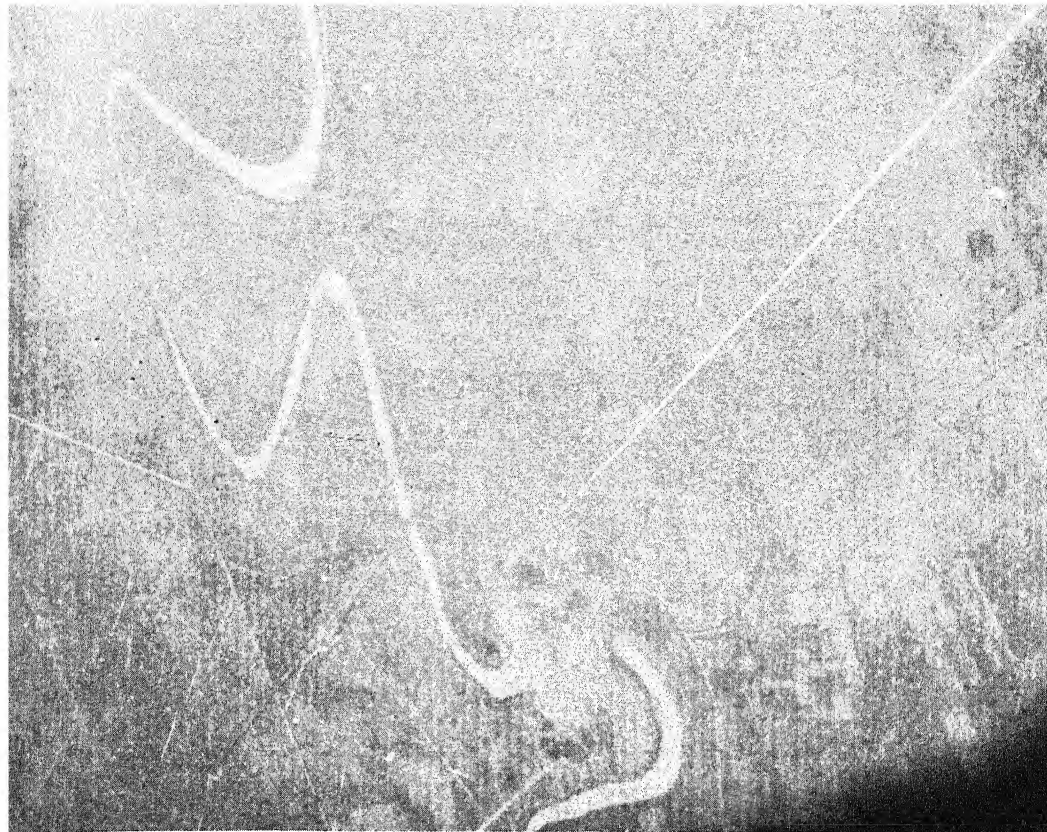
Middle Ages the town had held out for thirty-one years against the Saracens.

By this time it was apparent that the Italian troops had no heart for the battle. It also was evident that the Germans intended to put up a stiff fight only in the northeastern part of the island, adjacent to their principal supply center of Messina. This plan was designed to contain large Allied forces, prevent the full strategic use of Sicilian airfields, and gain time for organizing the defenses of Italy. The Seventh Army met little opposition in the last two days of its advance; on 22 July the 2d Armored Division entered Palermo; on the 23d Trapani fell. The Seventh then swung eastward toward the accomplishment of its final objective: to drive the enemy into the Messina peninsula.<sup>23</sup>

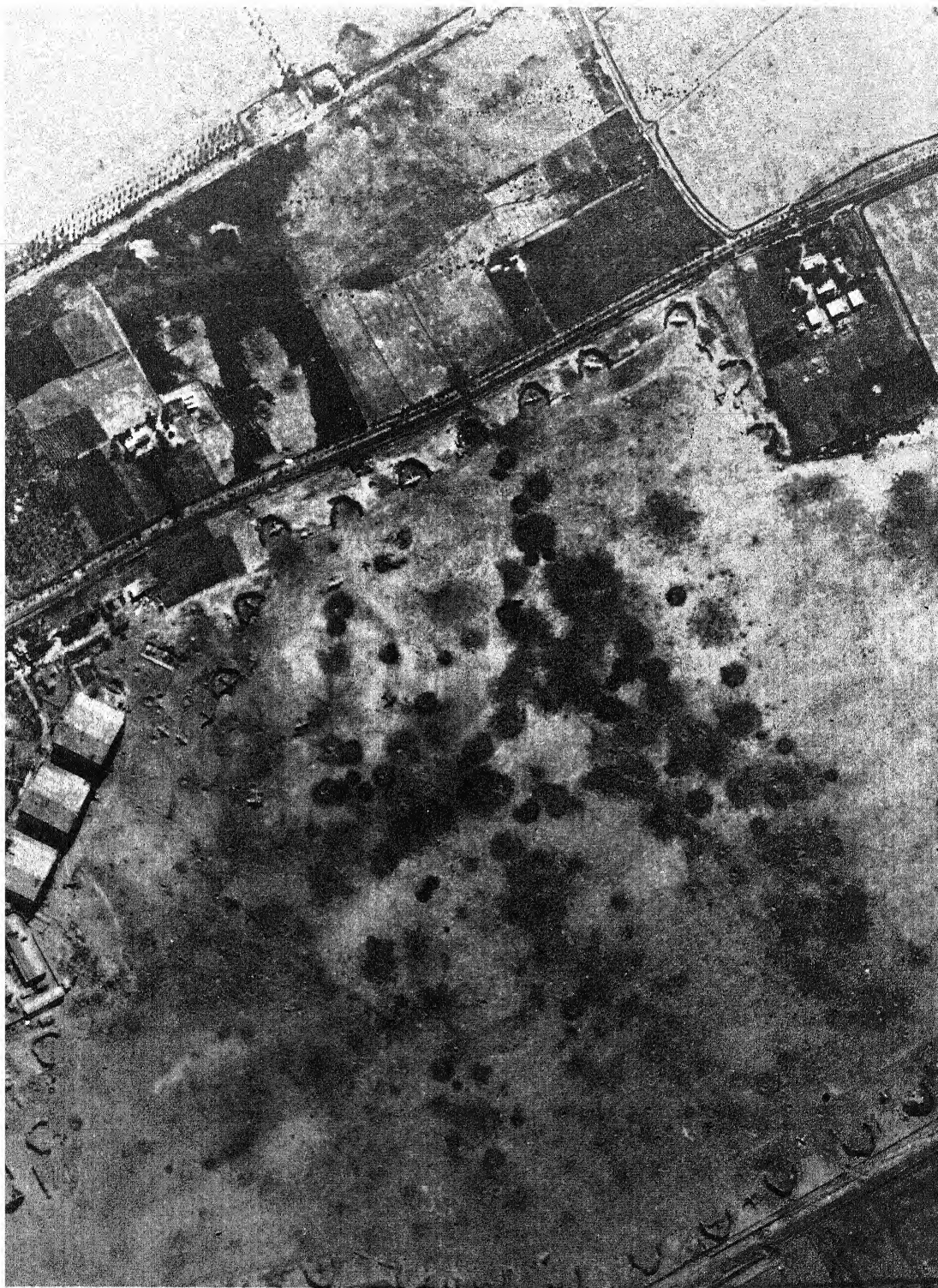
The American ground forces' drive to Palermo was so swift and the enemy's air opposition so meager that it was neither possible nor necessary for Tactical's XII Air Support Command to engage in large-scale close support. Air activity in the area of the Seventh's spectacular advance consisted almost entirely of strafing and bombing missions by fighters of Strategic Air Force against communications and targets of opportunity.<sup>24</sup> On the Eighth Army front, south and southwest of Catania, however, aircraft of TAF were constantly in action from the 17th to the 24th on behalf of the ground forces as they struggled slowly forward against severe enemy opposition. The Eighth was operating along two main axes: northward along the coast, and eastward along a line Leonforte-Regalbuto-Adrano. The Germans had been able to strengthen their forces around Catania by withdrawing troops from in front of the Seventh Army; the movement, beginning as early as the 13th, had been made easier by the failure of the British to cut two of the lines of communication from central Sicily to the east coast. The enemy also had moved troops from the northern part of the island into the area around Mt. Etna.<sup>25</sup>

During the grim struggle in the Catania area the tactical air forces played a major role.\* The principal communications centers formed a circle around Mt. Etna, the more important being Fiumefreddo, Randazzo, Troina, Adrano, and Acireale. In an attempt to isolate the battle area by systematic bombing of all lines of enemy approach, Tactical flew a total of 84 medium, 705 light, and 1,170 fighter-bomber

\* On 15 and 18 July, respectively, control of the USAAF 31st and 33d Fighter Groups reverted from Headquarters, Malta to XII ASC. However, the two groups continued to operate over the Eighth Army.







POSTHOLING

sorties from the night of 19/20 July to the end of the month against these and other targets on the circle. Aided by these air operations the Eighth pushed slowly forward, capturing Leonforte and reaching the outskirts of Agira on the 25th.<sup>26</sup>

During the week 17 to 24 July the Axis ground forces had no fighter-bomber support, nor did Allied bombers over Sicily meet any fighter opposition. (It was officially reported that a Canadian division, moving against Catania from the west, had "not seen one hostile aircraft" since coming ashore.) By the time the Seventh Army reached Palermo enemy air activity from Sicilian bases was nonexistent; his operating planes were based almost entirely in Italy. The overwhelming air superiority of the Allies left our bombers free to hit lines of communication in Sicily, but not entirely free to operate against distant targets. It continued to be General Eisenhower's policy to give priority to air operations which would directly affect the land battle; any strength over and above that required for such operations would be used against critical points in the enemy's lines of communication. Hence, in the week which ended with the fall of Palermo, the chief targets attacked by the heavies and mediums were Italian rail centers and ports between Rome and Reggio and airdromes in southern Italy.<sup>27</sup>

The principal communications targets were Naples and Rome. On the 17th heavies and mediums of the Ninth and Twelfth struck the marshalling yards at Naples in one of the largest air raids of the summer. In the morning 77 B-24's of the Ninth attacked; they were followed that afternoon by 97 B-17's and 179 B-26's of the Twelfth. One hundred and sixty-four P-38's furnished escort. The 353 bombers dropped some 650 tons of bombs which destroyed large parts of the yards and the central station, industrial areas north and south of the railroad, and fuel installations to the east.<sup>28</sup>

On the 19th almost the entire strategic air force in the Mediterranean was sent against Rome in one of the most significant operations of the war. The decision to bomb the capital of Fascist Italy was based upon both military and political considerations and with full appreciation of the possibility of unfavorable reaction from the Roman Catholic Church, as well as from many artists, architects, historians, and others throughout the world. From the military point of view Rome was the heart of the Italian system of communications. All rail traffic between northern and southern Italy, with the exception of that routed direct from Bologna to such east coast points as Foggia and Bari, passed



through Rome's two large marshalling yards, the Littorio and the San Lorenzo. From the political angle an attack on Rome might be expected to have a tremendously adverse effect on Italian morale, already showing signs of sagging under the weight of constant national reverses; an attack might even drive a strong wedge between Mussolini and the bulk of the Italian people.

Rome, however, was no ordinary target. It was the "Eternal City," the cradle of Western civilization; it was the seat of the Pope, the center of the Catholic world. Every precaution had to be taken to bomb only targets of military significance; places of religious or historic importance must not be damaged. Both the CCS and General Eisenhower recognized the importance of careful selection and training of crews, of distinguishing between bombing Rome itself and bombing its marshalling yards, and of telling the story of the raid as quickly as possible after the event and in such a way as to stress the limited nature of the objective and the care taken to strike it and it alone. Not even the enemy's military headquarters would be touched; all targets lay in the suburbs.

On 19 July the carefully trained and thoroughly briefed USAAF crews carried out the mission substantially as planned. More than 500 bombers participated, hitting the Lorenzo and Littorio yards in the morning and the Ciampino airfields in the afternoon; in all, they dropped around 1,000 tons of bombs. Photographs taken on 24 July showed that four groups of B-17's had placed many hits in the Lorenzo yards, causing widespread and severe damage to tracks, rolling stock, installations, and near-by industrial plants. At the Littorio yards five groups of B-24's had placed direct hits on the tracks in at least forty-four places, smashed or burned out a large amount of rolling stock, and put five direct hits on the main line to Florence. At both Lorenzo and Littorio the yards were out of action. The effect of the damage should be viewed in conjunction with the raid of 17 July on the Naples yards. The two attacks produced a gap of some 200 miles in the Italian railroad system between points north of Rome and south of Naples and prevented for at least several days the movement of Axis troops and supplies by rail from central to southern Italy.

Two groups of B-25's and three of B-26's, with P-38 escort, severely damaged the airdrome at Littorio and the two at Ciampino. Buildings, stores, facilities, and grounded aircraft were destroyed, and the landing and dispersal areas heavily cratered.

Nonmilitary objectives suffered only slight damage. No major religious or historic shrine was touched, save for the Basilica of San Lorenzo which, together with its cloisters, was badly damaged. The operation was a tribute to American precision bombing, but General Spaatz reported to General Arnold that the attack had "very little interest" from an air force standpoint because it was "too easy." Enemy opposition, indeed, had been very slight. Not more than thirty Axis planes attacked, none of them aggressively, while flak was heavy and accurate only over the Ciampinos. Out of the force of more than 500 Allied aircraft only 2, a B-25 and a B-26, were lost.<sup>29</sup>

The five B-24 groups of the Ninth Air Force which had participated in the Rome mission were thereafter withdrawn from participation in HUSKY to begin training for a low-level attack which had been scheduled for 1 August against the Ploesti oil refineries.\* The Twelfth Air Force, however, continued its attacks against communications targets in southern Italy. On the night of 20/21 July a small force of Wellingtons raided Naples; on the 22d, seventy-one Fortresses of the 97th and 99th Bombardment Groups hit Foggia, forty-eight B-25's bombed Battipaglia, and fifty-two B-26's pounded Salerno. The rail lines of the three places were so badly damaged that all traffic was stopped pending extensive repairs.

From the 17th through the 23d the Twelfth attacked airdromes in southern Italy on a round-the-clock schedule. The bulk of the enemy's bomber force was by this time based at Foggia, with small formations at Grottaglie and San Pancrazio in the Heel and at Viterbo and Ciampino near Rome. Most of his fighter-bombers and single-engine fighters were in the Heel and Toe, while the twin-engine fighters were around Naples. Besides the attacks on the Littorio and Ciampino airdromes in connection with the attack on Rome, the Twelfth struck hard at Pomigliano, Montecorvino, Aquino, and Capodichino in the Naples area, at Vibo Valentia and Crotone, at Leverano in the Heel, and at Grosseto located halfway between Rome and Pisa. The cumulative effect of these intense and generally successful attacks further reduced the already dwindling Axis air strength in the central Mediterranean, deprived the enemy's land forces of effective air support in Sicily, and reduced to 1 per cent per mission NAAF's wastage rate from enemy action.<sup>30</sup>

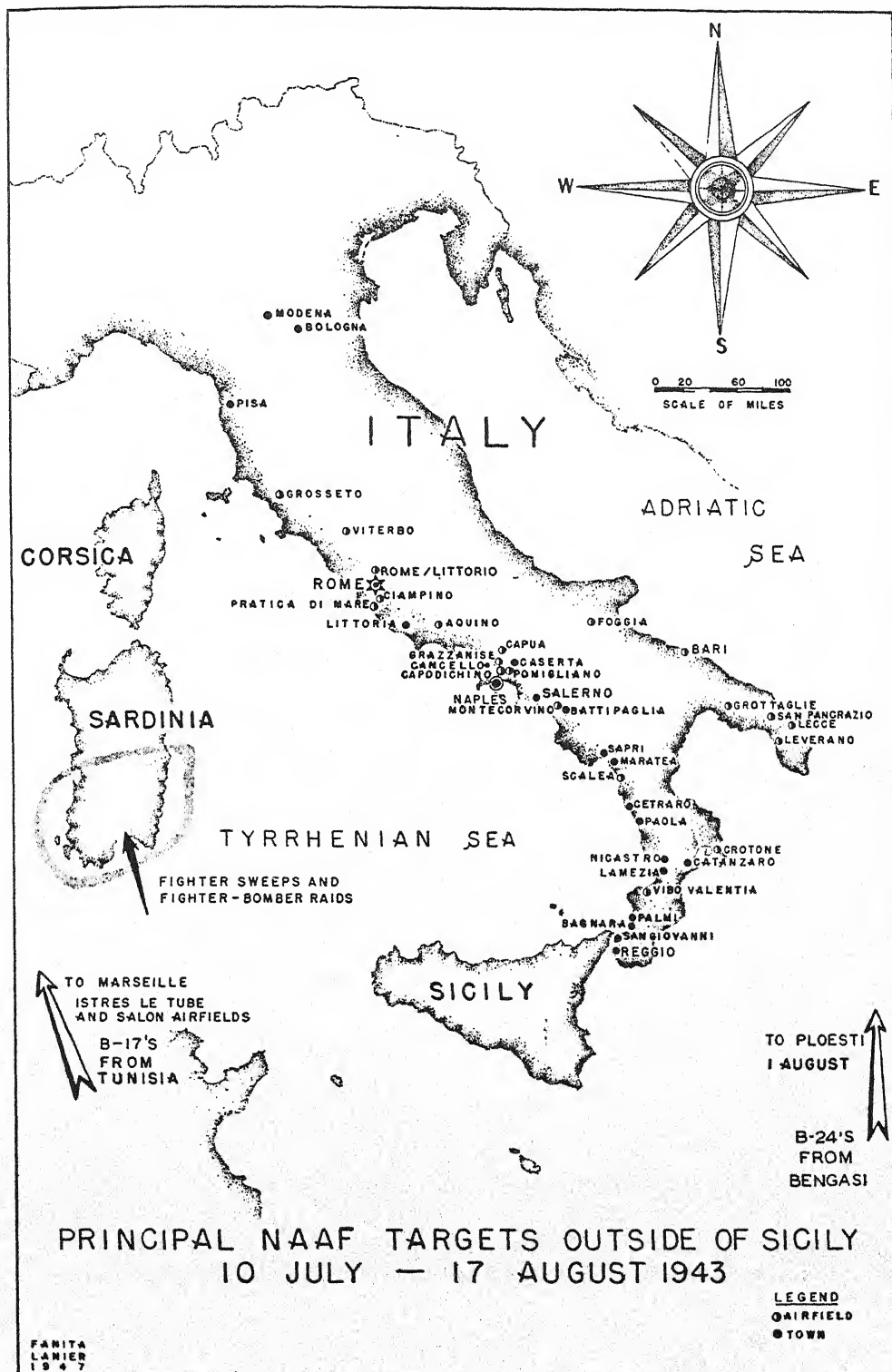
Following the capture of Palermo, the Seventh Army had turned

\* See below, pp. 477-840.

eastward. Driving against determined enemy resistance, the 1st Division captured Nicosia on 28 July and the 45th advanced along the coast to within five miles of San Stefano. Concurrently, the Eighth Army held its line below Catania with little change in positions, except that the Canadians, swinging on the Catania area as a door on a hinge, made some progress in the central sector against stiff opposition and succeeded in capturing Agira on the 28th.<sup>31</sup>

During these limited advances Tactical's planes were constantly in action. All units of the U.S. 64th Fighter Wing had moved to Sicily before 30 July; except for the 111th Tactical Reconnaissance Squadron, they were used almost exclusively as fighter-bombers. The majority of missions flown were either against ground targets located by air reconnaissance or against shipping; the remainder were against targets of opportunity. Principal objectives included the towns of Troina, San Stefano, Regalbuto, and Randazzo; the ports of Catania, Messina, and Milazzo; and such targets as supply dumps, roads, bridges, motor transport, ships, and port areas. During the last week of the month a particularly heavy effort was directed against Milazzo, which at this stage was one of the enemy's busiest ports as well as his most active seaplane base. Between 24 and 30 July, 38 B-25's, 196 Bostons and Baltimores, and 251 fighter-bombers visited the town. Another major target, Regalbuto, was an important communications center; on 26 July alone, 215 USAAF A-20's and RAF and SAAF Bostons and Baltimores attacked it, severely damaging the town and its approaches.<sup>32</sup>

With the capture of Nicosia and Agira on the 28th the stage had been set for an all-out assault on the Etna line. The enemy at that time held a triangular section of Sicily, marked off by Messina, San Stefano, and Catania. The battle line ran from a few miles west of San Stefano to the sea below Catania, by way of Troina, Regalbuto, and Catenuova. The terrain along this eighty-mile front favored the defenders: Mt. Etna dominated the area and narrowed the front on which attacks could be launched; the wild mountain country provided few roads, and the principal routes were commanded by hilltop towns which a handful of men could hold against greatly superior numbers. Even when the defenders were driven from a position, a few well-placed mines and demolitions would sharply impede Allied advances and give the enemy time to fall back on other prepared positions. In addition, the Allies would have to fight the remainder of the campaign almost altogether against German forces, which not only were battle-tested



but had been strengthened by units of the 29th Panzer Grenadier Division sent from southern Italy. The enemy's obvious intention to impose a maximum of delay on the Allied advance presaged hard fighting for the Seventh and Eighth Armies.<sup>33</sup>

On 31 July a directive of the Seventh Army laid down the general plan for its part in the final phase of the campaign. The II Corps was to advance on Messina along two main lines: one, the north coast road; the other, the road from Nicosia to Randazzo. I Provisional Corps was to organize and consolidate western Sicily, defend Palermo, and support the advance of the II Corps by moving reinforcements to the east. The British Eighth Army would concentrate its offensive along the lines Regalbuto-Adrano and Raddusa-Adrano while maintaining heavy pressure in the Catania sector.

The 45th Division, with the U.S. destroyer *Rowan* furnishing naval fire support, took San Stefano on the night of 30/31 July, while the "Fighting First" drove to within five miles of Troina. The 3d Division then relieved the 45th in the coastal area. On 1 August the Allies delivered coordinated attacks along the entire front. On the 2d the British launched a heavy attack through the Dittaino bridgeheads, and by the end of the 3d were fighting on the outskirts of Adrano, the capture of which would sever the enemy's lines of communication around the base of Mt. Etna. To meet this threat the Germans withdrew from the Catania area, and on 5 August the British entered what had been the enemy's main stronghold without firing a shot.<sup>34</sup>

The struggle for Catania provided a fine example of the isolation of the battlefield through the medium of air power. The communications nexus formed by Paterno, Misterbianca, Adrano, Regalbuto, Troina, Cesaro, Bronte, Randazzo, and Fiumefreddo was relentlessly attacked, while connecting roads were constantly strafed. Catania itself, from 10 July to 5 August, was subjected to attacks by 39 heavy bombers, 172 mediums, 10 light bombers, and 309 fighter-bombers.<sup>35</sup>

As the enemy began to evacuate Catania, the Eighth increased the pressure on the Adrano sector. The air effort also was intensified, and from 1 to 6 August, 129 medium, 223 light, and 24 fighter-bomber sorties were flown against the town, troop and gun concentrations, ammunition dumps, and roads in the vicinity. The effectiveness of the air assault was well illustrated when twelve B-25's of the 340th Bombardment Group dropped twenty tons of bombs on a very limited area in an effort to knock out three 88-mm. guns which were holding back the

Canadians. The historian of the 340th reported that "the bombs landed 200 yards away from the Canadians, wiped out all three guns, and the Canadians swept through." After very stubborn resistance Adrano fell on 6 August. Its capture rendered untenable the enemy's plan for holding a line south of Mt. Etna and made imperative a further withdrawal in the coastal area north of Catania.<sup>36</sup>

Meanwhile, in the American sector the main effort had been directed against Troina. The battle began on 1 August, but blown bridges, damaged roads, numerous mine fields, and enemy resistance of the most determined and vicious type delayed the advance. On the afternoon of the 4th the 1st Division launched a full-scale attack which began with a fifty-minute artillery and air assault. Eight and a half artillery battalions fired on enemy positions, while waves of thirty-six fighter-bombers dropped 500-pound bombs on the defenders of Troina. Although heavy casualties were inflicted by this bombardment, the enemy continued to fight stubbornly and held the Americans to a slow and limited advance. On the 5th the attack was renewed with XII Air Support Command furnishing direct aid by sending three dive-bomber missions against defense positions; in addition, twelve B-25's of 12th Bombardment Group (M) laid down a good pattern on Troina, and twenty-four RAF and SAAF Baltimores bombed road targets. On the following day the enemy withdrew, after having launched twenty-four counterattacks in five days, and the Americans entered the town. The struggle for Troina was probably the Seventh Army's most bitterly contested battle of the Sicilian campaign; Maj. Gen. John P. Lucas considered it the toughest battle fought by Americans since World War I.<sup>37</sup>

In the capture of Troina and Adrano, both key positions in the center of the Etna line, the Tactical Air Force played a direct and important part. From 18 July to 6 August its planes flew 265 fighter-bomber, 97 light bomber, and 12 medium bomber sorties against Troina. They inflicted such severe damage that, according to a ground force officer, thirty-six hours were required for the engineers to make a single-line traffic passage through the town. Yet Adrano was the harder hit. From 10 July to 7 August, 140 fighter-bombers, 367 light bombers, and 187 mediums battered the town, leaving it untenable. Again, engineers had to spend many hours clearing a road.<sup>38</sup>

Troina and Adrano provided good examples of one of the problems which confronted the Allies in Sicily and, later, in Italy: was it wise to



lay on concentrated air attacks and drive the enemy from a strongpoint when the destruction levied made impossible any chance of rapidly exploiting the situation? In terms of lives saved and morale strengthened, it generally seemed wise to smash the objective; certainly, a combination of strong air attack and superior firepower allowed the ground troops to maneuver and so eliminated costly frontal attacks.

After capturing Troina and Adrano the Allies immediately launched a two-pronged offensive against Randazzo, the enemy's last stronghold in the center of the Etna line, with the purpose of splitting the Axis forces in half and forcing a general retirement along the two coast roads to Messina. The Seventh Army drove along the road which ran through Cesaro; the Eighth pushed toward Bronte. In order to maintain pressure along the entire front and keep the enemy from shifting troops to the center, the Eighth also continued to exert pressure along the line Catania-Acireale and the Seventh drove eastward on the northern coast road.

The drive to Randazzo was accompanied by intensive air attacks, for as the value of the air effort to the ground action became more widely known and appreciated, increasing demands were made on it. Randazzo itself quickly became one of the most heavily bombed targets in Sicily. The peak of the bombing effort was reached on the 7th when 104 U.S. Mitchells and 142 U.S. Bostons and RAF and SAAF Bostons and Baltimores plastered the town and its approaches. This effort was not surpassed on any succeeding day, but the pressure was maintained at a high degree of intensity. Between 1 and 13 August a total of 425 medium bombers, 248 light bombers, and 72 fighter-bombers attacked the town; during the entire campaign 1,180 sorties were flown against it. Though maintaining resistance of the most obstinate sort, the enemy yielded to the steady pressure of the ground forces and the severe air assault, and on 13 August the Allies occupied the town.<sup>39</sup>

With the fall of Randazzo, the enemy lost the last road junction connecting his positions in the north with those on the east coast. He had then no choice but to pull back the two ends of his line. Actually, the withdrawal already was well under way, with the Allies contributing heavily to the process by driving along both coast roads. Between the 5th and 13th the Eighth had advanced from Catania to a few miles below Taormina on the coast and to a point near Linguaglossa in the interior; the Seventh had passed San Fratello and Cape Orlando and was nearing Barcellona.

The British advance was largely a matter of clearing a path through extensive and systematic demolitions and of pushing back the enemy's rear guard. Acireale fell on the 8th. The enemy then stiffened and held his lines with little further change until the 12th when the British swept quickly to beyond Riposto, taking Fiumefreddo on the 13th. During this advance fighter-bombers maintained their daily strafing missions, while Bostons and Baltimores flew sorties against defended positions and towns.<sup>40</sup>

The progress of the Americans along the northern coast road was more difficult and more spectacular. There the Germans, with fresh troops and the able assistance of steep gorges, were able to conduct a slow withdrawal after the loss of San Stefano on 31 July. In this situation the Seventh Army resorted to leapfrog landings which greatly accelerated its advance. The first of these was carried out on the night of 7/8 August at a point in the enemy's rear two miles east of San Agata. Some seventy-five fighter sorties covered the landing. The move completely surprised the enemy, broke all opposition around San Fratello, and enabled the main units to capture San Agata and gain contact with the landing force late in the day.

The second amphibious operation took place on 11 August when infantry, armored artillery, and tanks landed two miles east of Cape Orlando, where they captured a position across the coastal highway and railroad. The assault offered a fine example of cooperation between the three services. Naval gunfire from Task Force 88 supported the ground troops while XII Air Support Command attacked troop concentrations and gun positions in the area of the landing and on the roads approaching it. The landing, together with an attack by the 3d Division, forced the enemy to evacuate the Cape Orlando-Naso area, and by the end of the 12th he had retreated east of Patti.

Tactical Bomber Force fully supported the advance of the U.S. ground troops; on 12 August its planes flew twelve missions, involving eighty-four B-25's, thirty-six A-20's, and twenty-four Baltimores, and dropped approximately 126 tons of bombs on troops, ammunition dumps, and guns around Patti, Barcellona, and Novara. An observer described the work of the air arm in the drive along the north coast as "perfect, both in covering the advance, in dive-bombing the targets immediately in front of the Infantry, strafing the roads, [and] bombing the centers far in the enemy's rear."<sup>41</sup>

After the fall of Randazzo on the 13th the Sicilian campaign drew

swiftly to a close as the Allies plunged up both coast roads toward Messina. A third amphibious landing northwest of Barcellona early in the morning of the 16th helped the Seventh Army to take Spadafora, twelve miles west of Messina. Before the end of the day American artillery was firing at enemy batteries around Villa San Giovanni on the Italian mainland, and at 1600 hours the Seventh pushed its first strong patrols into Messina. In the Eighth Army sector Allied troops entered Taormina, Castiglione, Novara, and Mazzarra on the 15th. Emulating the successful tactics of the Seventh Army, the British made commando landings at Scaletta on the nights of 15/16 and 16/17 August, and on the 17th joined the Americans in Messina.<sup>42</sup>

During the last week of the campaign Northwest African Air Forces directed its main effort toward preventing the enemy's withdrawal across the Strait of Messina. The Germans had planned the retreat well ahead of the loss of their last positions in Sicily. Even as early as the last week of July there were indications of a limited evacuation by sea, and a document captured from the Hermann Goering Division dated 2 August 1943 revealed that the Germans intended to remove as much equipment as possible. There was nothing hurried about the withdrawal, but by 11 August the movement of both personnel and equipment, especially tanks, was in full swing. A fleet of small craft, protected by a tremendous concentration of flak, operated day and night across the narrow strait. According to Admiral Doenitz it transported daily up to 7,000 men with equipment, 10,000 without equipment. NAAF struck at this evacuation fleet at the Sicilian ports, in transit, and off the beaches of Italy.<sup>43</sup>

This air offensive, designed not only to damage the evacuation route but to interfere with the movement of supplies from the mainland to the Axis troops on Sicily, was launched during the last week of July when A-36's and P-40's bombed and strafed merchant vessels, barges, freighters, Siebel ferries, and other small craft. In the first week of August large-scale attacks were delivered on Messina and on the beaches north of that city to Cape Peloro. Between 1 and 7/8 August, inclusive, B-17's flew 121 sorties, Wellingtons 269, USAAF and RAF fighter-bombers 225, and U.S. P-40's 200. Messina was the principal target. The heavies bombed all supply points in the city, the mediums hit the marshalling yards (and the beaches below Cape Peloro), the fighter-bombers concentrated on shipping and docks, and the fighters attacked shipping in the harbor.

The scale of attacks was increased in the ten days from the 8th to the end of the campaign. From the night of 8/9 August to 13/14 August night-flying Wellingtons worked almost exclusively on evacuation beaches; thereafter, they bombed ports along the Italian shore. They flew an average of around eighty-five sorties per night. Mediums and fighter-bombers conducted an even heavier offensive by day, flying 1,170 sorties from the 8th to the 17th. Most of these were against vessels in the strait, but some were against craft along the Italian beaches and landing points on the shore. The greatest intensity of effort came on 15, 16, and 17 August when, in the face of severe flak, Wellingtons, Mitchells, Bostons, Baltimores, Warhawks, and Kittyhawks made round-the-clock attacks, bombing and strafing troop-laden craft at the evacuation beaches, in the strait, and along the mainland.<sup>44</sup>

In spite of the efforts of both Tactical and Strategic the Germans effected a partially successful withdrawal, saving the equivalent of at least one division with equipment.\* Several factors made this achievement possible. The Germans, as has been indicated above, had planned and started the withdrawal well in advance, some of the heavy equipment such as tanks having been removed during the latter part of July. Sicily's mountainous terrain made it possible for the defenders to delay the Allies by the use of mines and demolitions. The enemy used extensive night traffic which he protected with a good concentration of flak on both sides of the narrow strait—which could be crossed in a matter of minutes. Even so, the air forces took a large toll of enemy shipping. Claims listed the destruction of 23 craft, direct hits on 43, and near misses on 204.<sup>45</sup>

While Tactical Air Force operated so as to be of direct assistance to the ground forces in the reduction of the island, Strategic played a dual role: it joined Tactical in the attack on enemy ports and shipping, as noted above, and it continued to bomb communications targets and airdromes in southern and central Italy as part of the plan to force the enemy to abandon his Sicilian positions. The attack on Italian targets, however, was on a somewhat reduced scale after the fall of Palermo, and until the end of the campaign Strategic never equaled its effort of the period 10 to 24 July. The main reason for this was combat fatigue, which developed quickly in the Mediterranean theater during the

\* Of equal importance to future operations was the fact that the enemy's delaying action gave him needed time in which to bring into Italy large numbers of troops from Germany, France, and Austria.

summer months where the weather almost never forbade flying nor interfered with aircraft maintenance. Any effort to increase the frequency of operations was certain to result in lower efficiency and higher losses; the only satisfactory solution was a higher replacement rate of aircrews—which, currently, was not possible.<sup>46</sup>

In spite of combat fatigue and extensive operations against evacuation ports and shipping, Strategic was able to continue on a fairly large scale its offensive against lines of communication and airdromes in Italy. The principal communications targets were San Giovanni, Salerno, Paola, Marina di Catanzaro, Battipaglia, Sapri, and Naples on the Tyrrhenian coast, and Rome and Bologna. The most significant of the attacks was the one against Rome. A mission planned for 1 August had been canceled by General Eisenhower who felt that the endurance of the bomber crews and long-range fighter pilots was just sufficient to complete the Sicilian campaign, to which priority in all operations had to be given. By the 13th, however, the land battle was going so well that it was decided to carry out on that day a second large-scale raid against the Littorio and Lorenzo marshalling yards. The attack was handled by 106 B-17's, escorted by 45 P-38's, and by 102 B-26's and 66 B-25's escorted by 90 P-38's—all from the Twelfth Air Force. The planes dropped approximately 500 tons of bombs, heavily damaging the yards, rolling stock, and installations and the airdrome at Littorio. As in the attack on 19 July damage to nonmilitary targets was negligible. In spite of interception by a force of some seventy-five enemy fighters the Twelfth's planes completed the attack with the loss of only two B-26's, while the enemy losses were listed as five planes destroyed and five probables.<sup>\*47</sup>

One of the interesting operations during this period came in an attack on 4 August against rail and road bridges at Paola and Catanzaro by more than 100 mediums of NAAAF. The operation was not successful but it brought into the spotlight a new type of objective which, until the end of the war in the Mediterranean, would be a primary target for the Allied air forces. The topography of Italy required an unusually

\* NAAAF's attacks on communications during the last days of HUSKY were complemented by RAF Bomber Command night raids from the United Kingdom. Milan was bombed on 7, 12, 14, and 15 August by a total of 916 planes; Turin was hit on the 7th, 12th, and 16th by 380 planes; and Genoa was attacked on the 7th by 73 planes. On 16-17 August, 140 B-17's of the Eighth Air Force bombed Regensburg, then flew to North African bases; a week later 84 of the planes returned to the United Kingdom, bombing Bordeaux en route.

large number of bridges, many of them in isolated areas where defense and repair were difficult. The bridges were much harder to hit than were marshalling yards, but their repair was apt to be slower and re-routing of traffic more difficult.<sup>48</sup>

The second major objective of Strategic during the last three weeks of HUSKY was airdromes. Attacks were directed against fields from which enemy fighters and bombers might reach Sicily and the Allied lines of communication in the central Mediterranean: Scalea, Capua, Montecorvino, Capodichino, Viterbo, Aquino, Grottaglie, Pratica di Mare, Crotone, Grazzanise, and Foggia, all located in southern or central Italy. Heavies, mediums, dive bombers, and single-engine fighters participated, and results generally were good. With a few exceptions these counter-air operations met only limited enemy opposition. The heaviest air battle developed on 16 August during an attack on the Foggias by B-24's of the Ninth Air Force. Between 75 and 100 enemy fighters engaged the Liberators; eight of the B-24's were lost but the heavies claimed forty-five of the enemy. These final HUSKY operations brought to 4,846 effective sorties and 8,009 tons of bombs the total effort by planes of NAAF, Ninth Air Force, and RAF, ME against Italian, Sardinian, and Sicilian airfields between 4 July and 17 August. The total tonnage dropped on the three areas since the beginning of the war came to more than 13,000.<sup>49</sup>

NASAF's offensive operations were not confined to missions by its heavies and mediums. Its P-38's and P-40's carried out extensive fighter sweeps over Sardinia and the Toe of Italy. Lightnings of the 1st, 14th, and 82d Fighter Groups handled operations against mainland targets. From 8 through 17 August they flew daily missions against the enemy's evacuation route, bombing and strafing trains, tracks, motor transport, radar stations, bridges, and targets of opportunity. Carrying 500- or 1,000-pound bombs and meeting little opposition or none, the P-38's did considerable damage to the enemy's supply and escape route, especially by destroying transport and railway equipment already jammed by earlier bombings.

Sardinia, which had been such a frequent target for bombers prior to the invasion of Sicily, required after D-day only the attention of Allied fighters and fighter-bombers, which directed their sweeps and raids against supply centers, factories, bivouac areas, gun emplacements, etc. On some of the raids heavier opposition was encountered than in missions over Sicily and Italy. In particular, on 30 July a major



air battle developed in the course of which the enemy lost twenty-one planes against an Allied loss of one P-40. The poor tactics and coordination displayed by the enemy pilots indicated that they were inexperienced and had little knowledge of the capabilities and limitations of their own Me-109's or of the Allies' P-40's.<sup>50</sup>

In the last three weeks of the Sicilian campaign the Axis air forces furnished scant support to the hard pressed ground troops. Enemy fighters were seen only rarely over Sicily, the evacuation route, or southern Italy; occasional night fighters were reported over the Strait of Messina, but no combats were reported. Allied heavy bombers met sporadic opposition, some missions seeing no enemy fighters and others running into as many as 75 to 100.

Offensively, the GAF increased the scale of its bomber activity. Fighter-bombers raided Allied shipping on the north and east coasts of Sicily and attacked the ground troops which made the leapfrog landings between Palermo and Messina. Bombers struck at landing grounds in Sicily and shipping in North African ports and along the convoy routes. The heaviest of these raids involved from twenty-five to fifty planes, and on two of them (4 and 14 August against Bizerte) "window" was used, but the attacks came so infrequently and were so well handled by NACAF's fighters that the total damage inflicted was small. Most of the enemy's long-range bombers operated from the Foggia complex and Viterbo, but in the last week of the Sicilian campaign Allied reconnaissance revealed 140 He-111's, Do-217's, and Ju-88's based in southern France. This figure represented a sharp increase in strength and on 17 August NASAF sent its first mission over this new and fertile hunting ground. A force of 180 B-17's from the 2d, 97th, 99th, and 301st Bombardment Groups dropped 25,619 x 20-pound fragmentation bombs on the Istres/Le Tubé and Salon airdromes, located about twenty-three miles northwest of Marseille. Strike photos showed ninety-four aircraft destroyed on the ground and some twenty-eight others damaged, in addition to extensive damage to hangars and workshops at Istres and to administrative buildings at Salon.<sup>51</sup>

Throughout the campaign Coastal Air Force had continued to carry out its routine but numerous and important tasks of coastal defense, convoy protection, air-sea rescue, and antisubmarine patrol. By the last week of July convoys moved unmolested along the coast of North Africa, and this lessening of the enemy's air and submarine effort, together with a decline in the number of ships to be protected, afforded

Coastal an opportunity to operate offensively over Italian waters. From 22 to 28 July, Beaufighters sank four merchant vessels and a schooner, damaged six craft, including a destroyer and a 4,000-ton merchant vessel, and shot down eight aircraft; during all of HUSKY, Allied planes sank seven Italian merchant ships. Air-sea rescue increased as HUSKY lengthened out, as did defensive flights caused by enemy air activity against Allied shipping and ports. In spite of the fact that NACAF's organization was relatively new and its equipment limited, it performed its duties so capably that General Spaatz declared: "You have excelled in all of the many fields of your activities."<sup>52</sup>

### *Ploesti*

In the midst of the Sicilian campaign, on 1 August, Mediterranean-based heavies executed one of the outstanding air operations of the war. This was the low-level B-24 attack on the Ploesti oil refineries in Rumania—the first large-scale, minimum-altitude attack by AAF heavy bombers upon a strongly defended target and the longest major bombing mission, in terms of distance from base to target, undertaken up to that time.<sup>53</sup> The mission was not perfectly executed—but it heavily damaged the objective and as an example of brilliant conception, painstaking preparation, and heroism during execution,\* the operation had few if any equals.

Oil had been given a high priority in the planning of the Combined Bomber Offensive, but Ploesti, most inviting of all oil targets, lay beyond the reach of planes based in the United Kingdom. It was estimated that crude oil provided two-thirds of Germany's petroleum resources and that 60 per cent of her crude oil came from the Ploesti fields†—which was to say, approximately one-third of her total supply of liquid fuel.<sup>54</sup> These fields, with an estimated annual capacity of nine million tons, were considered to be of special advantage to the Germans in their operations on the eastern front, and thus an attack on Ploesti offered the means for rendering immediate assistance to the U.S.S.R. The Russians themselves had bombed the fields several times in the summer of 1941 and again in September 1942, but with limited success.<sup>55</sup> Within a month after Pearl Harbor the Americans were studying the feasibility of bombing Ploesti,<sup>56</sup> and AAF planes had struck at it from the Middle East in the ineffective Halverson attack as early as

\* No less than five Medals of Honor were awarded to participants in the mission.

† See above, pp. 358, 364-65, 367.

June 1942.\* Since then the Ninth Air Force had been heavily committed to other operations in the attempt to drive Rommel out of Africa, and the heavies of the Twelfth Air Force, based between Algiers and Constantine, were too far from the target. Only with the impending defeat of the Axis forces in Tunisia had circumstances combined to suggest the possibility of a mass attack on Ploesti from North Africa bases.

Principal contributors to the development of the plan included General Arnold, who, in April, had ordered the Plans Division of Headquarters, AAF to revive the project; Lt. Col. C. V. Whitney of the Ninth Air Force, who evolved a plan for a medium-sized, high-level attack to be mounted from Syrian bases; and Col. Jacob E. Smart of General Arnold's advisory council, who originated the idea of a minimum-altitude, mass attack from the Bengasi area.<sup>57</sup> Colonel Smart's plan was approved by General Eisenhower and by the CCS early in June. But because both Eisenhower and the CCS were unwilling for the operation to deprive HUSKY of too many heavy bomber sorties, the planners agreed that NAAF would furnish only two groups of B-24's to Operation SOAPSUDS (formerly STATESMAN, later, TIDAL-WAVE) and that the remainder of the striking force would be provided by transferring two groups of B-24's from the Eighth Air Force (93d and 44th) and diverting one group (the 389th) originally scheduled to move to the United Kingdom.<sup>58</sup>

General Brereton, as commander of the Ninth Air Force, had charge of conducting the operation. His was the final responsibility for deciding to launch the raid from Libyan rather than Syrian bases and to attack at low instead of high altitude. Under his direction the detailed plans for the operation were worked out and training conducted.<sup>59</sup>

Final planning for the mission became the responsibility of a special staff at Brereton's advanced headquarters which included, in addition to Colonel Smart, specialists in such matters as low-altitude operations, intelligence, and weather.<sup>60</sup> It was finally decided to hit a limited number of key installations in each of Ploesti's nine major refineries. More than forty distilling units, cracking plants, and boiler houses were selected and grouped into seven general targets, five of which were at Ploesti, one at near-by Brazi, and one at Campina, some eight miles away. Originally, 154 planes were allotted to targets, roughly according to importance and number of key installations; final allotments, however,

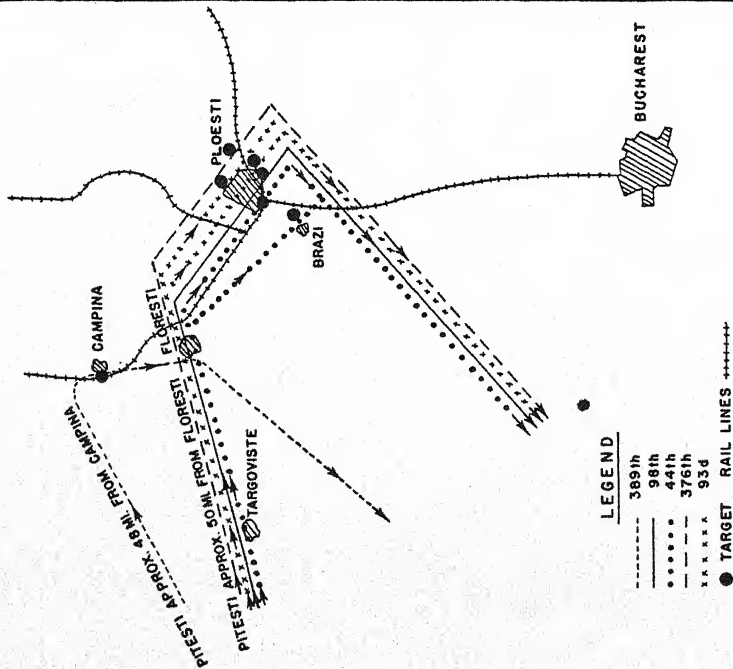
\* See above, p. 10.

totaled 177 planes. Forces assigned to the seven general targets were as follows: the 376th Bombardment Group—the oldest group of heavies in the Mediterranean—was given Target WHITE I (the Romana Americana refinery) and the honor of leading the flight; the 93d, which would fly directly behind the 376th, had Targets WHITE II and III (the Concordia Vega, Standard Petrol Block, and Unirea Speranta refineries); the 98th was assigned Target WHITE IV (Astra Romana and Unirea Orion); the 44th got Targets WHITE V (Columbia Aquila) and BLUE (Creditul Minier at Brazi); the new 389th, which would fly an individual effort, was responsible for Target RED (Campina).<sup>61</sup>

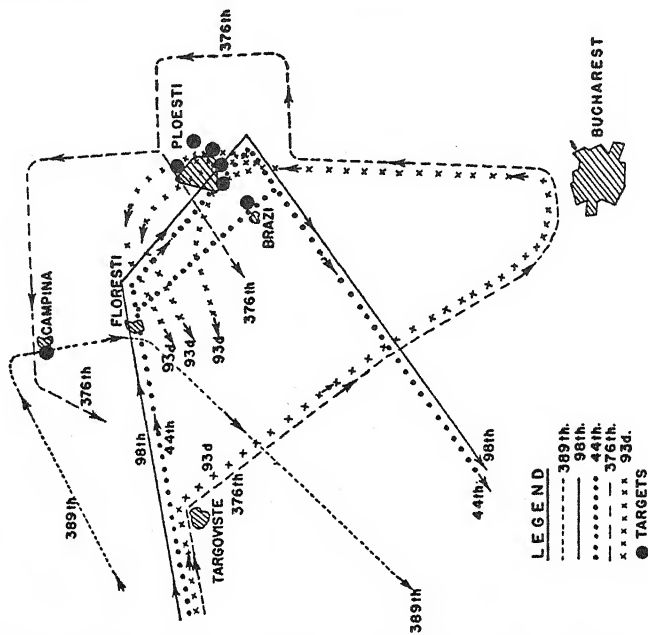
Other major problems which had to be solved by the planners concerned the type of bombs to be used and the requirement of a different kind of bombsight from the one used in high-altitude bombing. Eventually, it was decided to arm the mission with 1,000-pound and 500-pound demolition bombs, totaling 311 tons, plus 290 boxes of British-type and 140 clusters of American-type incendiaries. The number of demolitions was 170 more than the number estimated as required to insure destruction of the targets; all had delay fuzes, those to be dropped by the first and second waves carrying delays of from one to six hours and those by the last wave of forty-five seconds. The planes were equipped with a new low-level bombsight and with two auxiliary bomb-bay tanks, which gave them a fuel capacity of 3,100 gallons.<sup>62</sup>

The 93d, 44th, and 389th Groups arrived in the Mediterranean between 26 June and 3 July.<sup>63</sup> There they joined the 376th and 98th in missions on behalf of HUSKY, partly for training purposes and partly to strengthen the air arm during the most vital part of the Sicilian campaign. Between 2 and 19 July, inclusive, the five groups flew 1,183 sorties—more than double the normal effort—against a total of seventeen different targets. These operations reached their climax with the attack on Rome of 19 July.<sup>64</sup> On the following day the five groups were withdrawn from operations for intensive training near Bengasi. Between that date and 1 August the crews practiced flying and bombing from minimum altitude and absorbed great quantities of data dealing with the route to be flown, the targets, enemy defenses, and the dozens of other items which had to be clearly understood and appreciated by the aircrews if TIDALWAVE was to be a success. A dummy target—a flat reproduction of the Ploesti targets laid out in a remote section of the desert—was bombed again and again until, as a crew member wrote,

# PLOESTI ATTACK AS PLANNED



# PLOESTI ATTACK AS EXECUTED



"we could bomb it in our sleep." Strenuous practice in flying virtually wing tip to wing tip and wave on wave was conducted. On 28 and 29 July the entire task force participated in two coordinated and fully successful mock missions; on the second dry run the bombers "completely destroyed" the targets in less than two minutes.<sup>65</sup>

Soon after dawn on 1 August the 177 planes, carrying 1,725 Americans and 1 Englishman, took off under the command of Brig. Gen. Uzal G. Ent.<sup>66</sup> The 376th led the formation, followed (in order) by the 93d, 98th, 44th, and 389th. The route passed the island of Corfu, then swung northeastward across the mountains of Albania and Yugoslavia. Before the formation reached the Danube near Lom in Bulgaria, towering cumulus clouds destroyed its unity. Integrity might have been restored by the use of radio but this would have sacrificed the great advantage of surprise; consequently, the two lead groups reached the target somewhat earlier than the others, which cost the groups the advantage of delivering simultaneous blows and sent the following units over the target after the defenses had been alerted.

The first initial point (IP) was Pitesti, some sixty-five miles from Ploesti. There the 389th left the formation and proceeded to its target at Campina. There, too, all planes dropped to the minimum level of approximately 500 feet. Halfway between Pitesti and the final IP at Floresti (thirteen miles northwest of Ploesti), the commander of the leading 376th mistook the town of Targoviste for Floresti and turned southeast. Followed by the 93d the 376th flew to the outskirts of Bucharest before realizing that a mistake had been made. Unfortunately, Bucharest was the headquarters of Rumanian defenses, which were promptly alerted.

The 376th and 93d now turned northward toward Ploesti. Near the city they ran into such severe fire from ground defenses that the 376th turned east and then north in an attempt to reach its target from a less heavily defended direction. When the group reached a point northeast of Ploesti and in the vicinity of its target (Romana Americana), it met such intense AA fire that General Ent directed the planes to attack any target of opportunity which presented itself. Most of the group's bombs fell in the general target area but only those from six planes led by Maj. Norman C. Appold, which flew directly into Ploesti and emerged covered with soot, were unloaded on an assigned target, the Concordia Vega.

When the 93d reached the outskirts of Ploesti it did not turn east



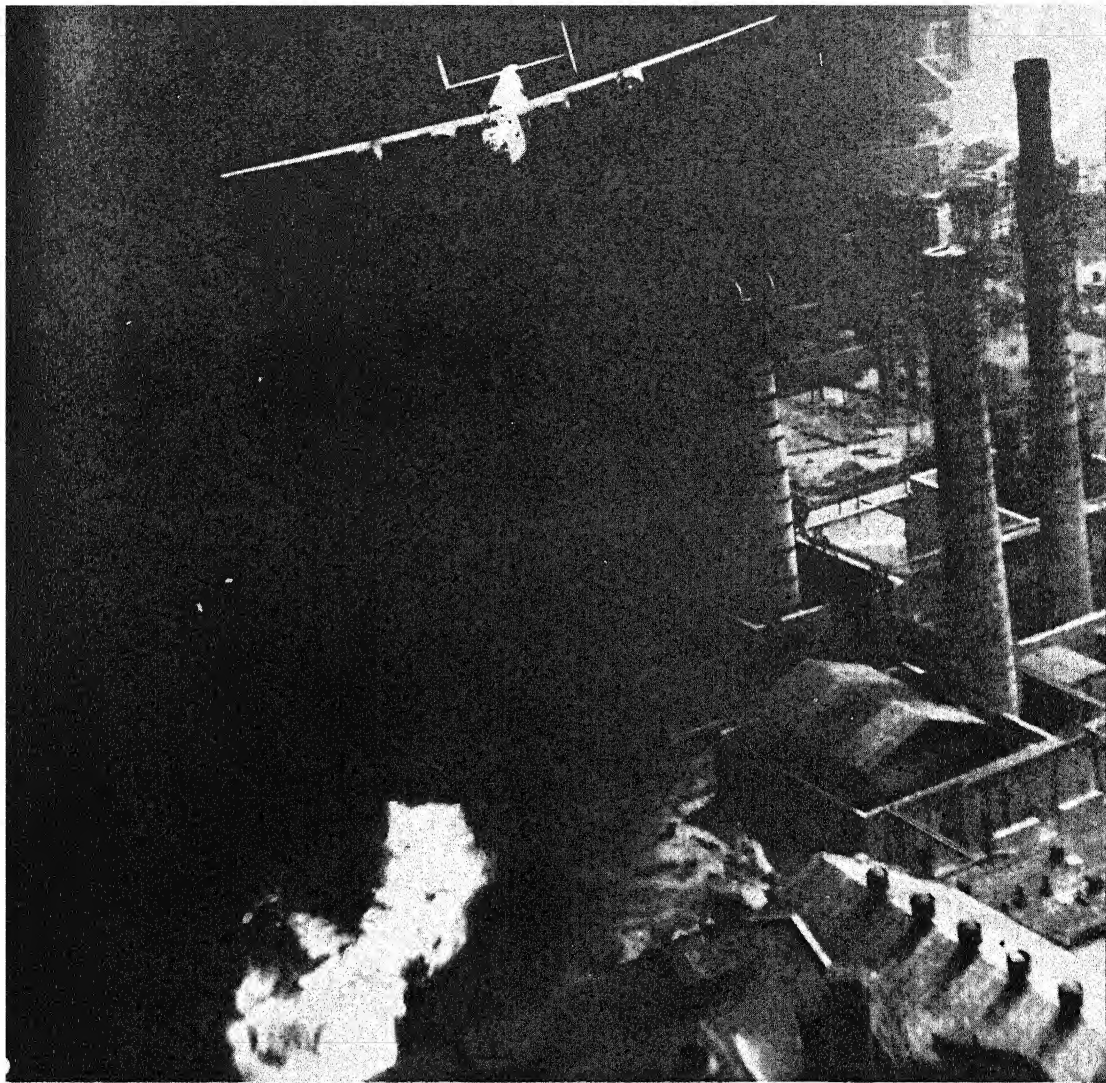
with the 376th but, instead, flew straight against the targets on the south side of the city. In spite of heavy flak and enemy fighters the group, going in at altitudes of from 100 to 300 feet and losing 11 planes over the target, did a good job on the Astra Romana, Unirea Orion, and Colombia Aquila refineries. Unfortunately, these were targets assigned to the 98th and 44th Groups.

Meanwhile, the 98th and 44th, commanded by Cols. John R. Kane and Leon W. Johnson, arrived at the correct IP just after the 93d had finished its run. They found the defenses thoroughly alerted. Equally bad, they had to fly through fires and the explosions of delayed action bombs left by the 93d. The two groups would have been justified in turning back; instead, they drove straight against their targets through intense flak, explosions, flames, and dense black smoke which concealed balloon cables and towering chimneys. B-24's went down like tenpins, but the targets were hit hard and accurately. As the two groups left Ploesti, they were jumped by enemy fighters, and on the way home were attacked by every kind of plane from Me-109's to unidentified biplanes, the last attacks coming after the Liberators were over the Adriatic. The 98th claimed thirty-three enemy planes destroyed, but it lost twenty-one over the target and on the return trip; the 44th claimed thirteen victories but lost eleven planes.

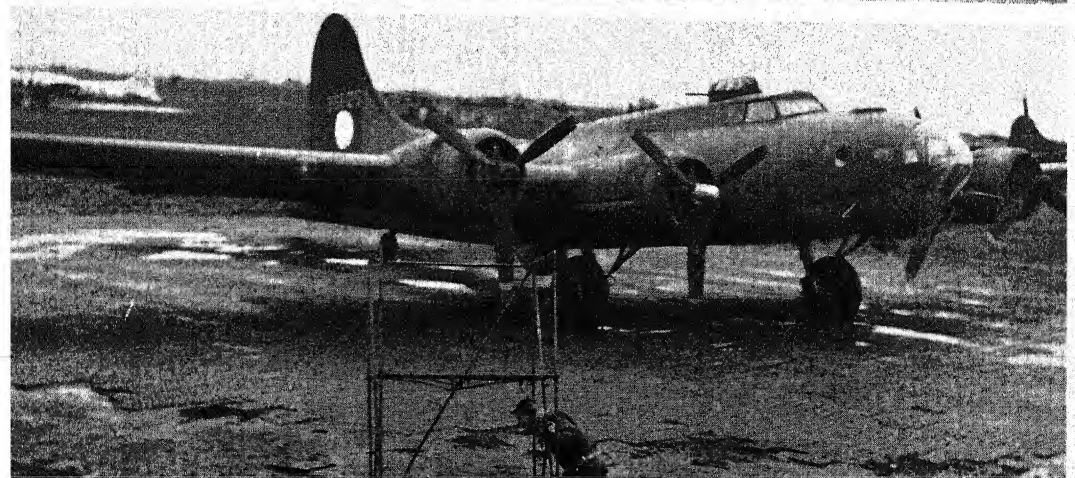
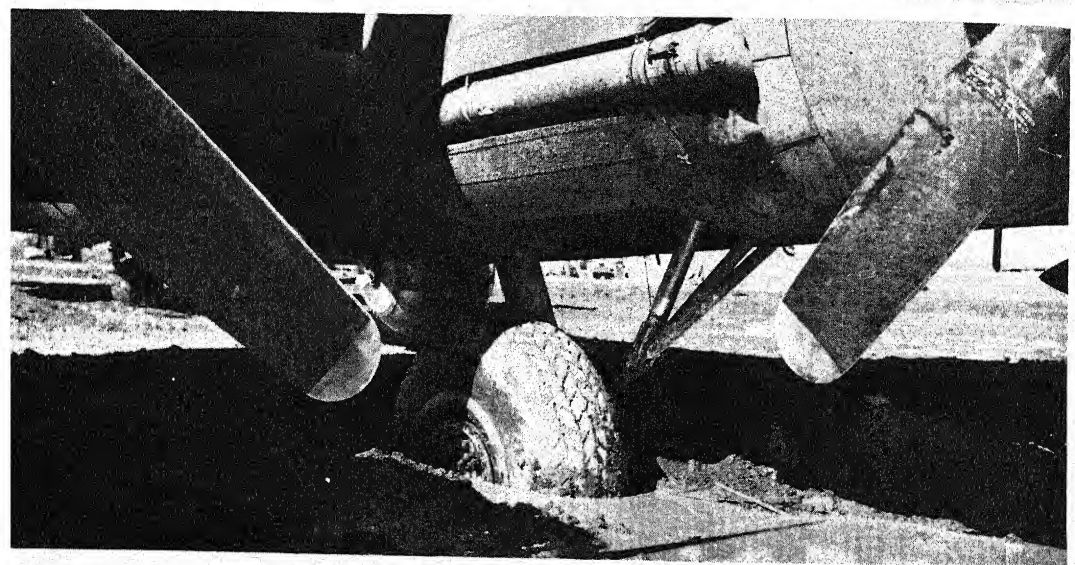
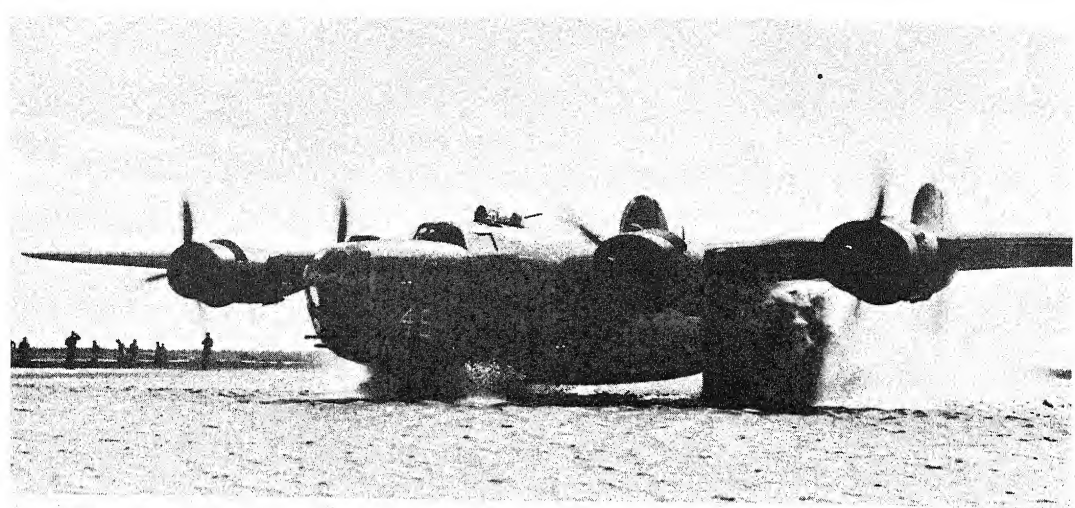
The less experienced 389th, led by Col. Jack Wood, had some trouble in getting into the right valley for its run against Campina, but it reached the target area with all the aircraft that had been dispatched and completely destroyed its objective. Its losses were the lightest of any of the four groups which actually attacked selected targets.

The bombers could not follow closely the flight plan for the return home from Ploesti because the groups had bombed at different times and in some instances had left the target accompanied by enemy fighters. No attempt was made to resume route formation as a unified force; each group, or part of a group, followed its own course, although the 98th and 44th remained together and most of the sound planes of all the groups followed the prescribed route to Berkovista, Corfu, Toca, and Bengasi. Planes in distress generally made for Turkey or the nearest Allied fields on Malta, Sicily, or Cyprus. The final count showed that ninety-two planes reached Bengasi, nineteen landed at other Allied fields, seven landed in Turkey, and three crashed at sea.

The Ploesti mission fell short of expectations and entailed heavy losses. Final reports showed that fifty-four planes had been lost, forty-



PLOESTI, 1 AUGUST 1943: THE ASTRA ROMANA REFINERY



one of them in action. Lost, too—dead, prisoners, missing, or interned—were 532 airmen.<sup>67</sup> On the credit side stood some very accurate bombing and a high degree of damage to the refineries—damage which might have been greater had not many bombs failed to explode. An estimated 42 per cent of Ploesti's total refining capacity was destroyed. Possibly 40 per cent of the cracking capacity was knocked out for a period of from four to six months, and the production of lubricating oils was considerably reduced.<sup>68</sup> But though the over-all damage was heavy, it was not decisive. The Germans made up for lost refining capacity by activating idle units at Ploesti and by speedy repairs to damaged plants.<sup>69</sup> The hope for virtually complete destruction of the selected targets with results enduring for a long period of time had been defeated by errors of execution. No plan had been made for following through with other attacks. Until the late spring of 1944 Ploesti went untouched as tactical operations and strategic targets considered to be of greater priority than oil claimed the attention of the Mediterranean-based heavies.

Before the B-24's on loan from the Eighth Air Force returned to England they participated in a mission against Wiener Neustadt on 13 August. The mission was the first flown from the Mediterranean against a target within the limits of greater Germany. It had been planned originally as part of a coordinated attack by Mediterranean-based and Eighth Air Force planes on the enemy aircraft production centers at Regensburg and Wiener Neustadt\* (Operation JUGGLER), but hopes for a coordinated attack were defeated by the weather and the mission against Wiener Neustadt was flown independently four days in advance of the famous Schweinfurt-Regensburg mission by the Eighth Air Force (17 August).

The mission was executed by the same five groups which had participated in the attack on Ploesti. Flying at a distance of over 1,200 miles from bases near Bengasi and through heavy clouds which tested to the utmost the skill of the navigators, the sixty-five planes which reached the target achieved complete tactical surprise—the 389th, the lead group, saw neither AA fire nor enemy fighters—and the bombing, through clouds unexpectedly thin, substantially damaged hangars, assembly plants, and grounded aircraft. None of the B-24's ran into trouble over the target or on the return trip except those of the 44th, which encountered five to ten FW-109's over the target and ten to fif-

\* See below, pp. 683-84.

teen Me-109's as the formation cleared the southeastern tip of Italy. The length of the trip forced the bombers to return to intermediate bases: one landed in Sicily, one in Malta, and sixty-one in Tunisia. Only two were lost.<sup>70</sup>

### *HUSKY in Retrospect*

The conquest of Sicily in thirty-eight days was in many respects a model campaign. In it were combined air, ground, and sea power in an operation which involved a large-scale triphibious landing followed by a hard-fought campaign against a tough enemy whose defense was strongly supported by mountainous terrain. That the Allies swept so swiftly to victory was owing in large measure to superiority in men, planes, and ships. In the two latter categories the predominance was overwhelming, but while the Navy was unchallenged by enemy surface forces, the air arm had to maintain its superiority by a constant and strong offensive against a skillful enemy.

The air phase of the campaign followed a pattern which later would be repeated on more than one occasion in the European and Mediterranean theaters. Prior to the landings, the air forces reduced enemy resistance by an offensive against airfields and lines of communication. At the time of the assault they covered the invasion fleet before, during, and after the landings, dropped airborne troops, and protected the beachheads. Then they made a concentrated effort against vital centers of communication to isolate the battle areas and gave direct cooperation in the land battle by tactical bombing and strafing in advance of the ground forces. As the campaign developed, they struck heavy blows against evacuation points and movements. Finally, the strategic air forces were relieved of participation in the land battle and began again long-range attacks against airdromes and communications centers in preparation for the next forward movement of the combined forces.

During HUSKY some U.S. commanders continued to experience difficulty in accepting command arrangements which gave full control of air forces to the air commander. There were ground and naval commanders who still expressed, despite the experiences in the Western Desert campaign and in the conquest of Tunisia, an understandable desire for personal control over the air units operating locally in coordination with their forces. But it was generally admitted that once the invasion was under way the new system worked so successfully that ground casualties from enemy action were comparatively light, that



shipping suffered little molestation, and that cooperation between Allied air and ground forces was satisfactory. Perhaps the principal criticism of the operations by the air arm on behalf of ground troops was that air support arrived too slowly when the Germans counter-attacked during the first week of the invasion—a tardiness that would seem to be explained chiefly by the distance between the front line and the bases from which the planes were required to fly. Perhaps more prompt and more accurate close support might have been provided if TBF had been divided between XII ASC and DAF; in fact such a division of TBF's light bombers later was found to be advisable during the Italian campaign.<sup>71</sup>

One of the main reasons for the small losses suffered by the invasion force was the overwhelming Allied air superiority which had been gained largely through the systematic, persistent, and heavy bombing of enemy airfields. The success which attended these attacks was probably the outstanding feature of HUSKY. The pre-invasion blitz drove about one-half of the German and Italian planes out of Sicily; at the end of the first week of the ground campaign a further withdrawal was forced so that only single-engine fighters were left on the island, and these were reduced in number from 240 to 125. They too were then driven to mainland bases. Proof of the effectiveness of the counter-air offensive was found in 1,100 abandoned enemy aircraft, 600 of them planes of the German Air Force, and in the approximately 740 planes which the Allied air arm destroyed in combat (against NAAF losses of around 375 planes) as the air assault forced the enemy to come up and fight.<sup>72</sup> Although the Sicilian campaign had its own special conditions which would not be fully duplicated in later campaigns or in other theaters, it appeared safe to conclude on 17 August that well-directed and heavy air attacks against the enemy's air arm and installations were essential both before and during an invasion and could be relied upon to reduce sharply the degree of loss of ground, naval, and air forces.

Tactical operations designed to isolate the battlefield at first found good targets, but as the campaign progressed the number of rail targets became very limited, and in the later stages attacks were discontinued to avoid damage to a means of transportation which the Allied armies wished to use themselves. Attacks against roads were directed largely against movement. They caused the enemy considerable trouble, as was shown in the later stages of the campaign by the absence of targets.



The concentrated attacks against the road junctions around Mt. Etna unquestionably helped to break the enemy's center which, in turn, led to the collapse of his entire position.<sup>73</sup>

In direct cooperation with ground troops—the most difficult of all air operations—achievements varied in direct proportion to the degree of coordination, timing, and training obtained. In some instances planes undershot the bomb line and bombed or strafed friendly troops; in other cases, ignorance of the exact location of Allied troops forced the air arm to pass up large areas of enemy troops. On the other hand, there were outstanding examples of excellent cooperation which materially aided the ground forces, for example, during the landings and at Troina. Kesselring considered the cooperation as very successful, stating that Allied successes in Sicily (and, later, in Italy) “must be attributed, in the first place, to the Allied air forces.” In general, the campaign pointed a need for more attention to combined training, for accurate and up-to-date information on the location of troops, for acquainting the ground troops with the fact that a direct-support operation takes time to mount, and for improvement in means of identification of targets and troops. Similarly, the number of times when ground troops fired on friendly planes indicated a need for training in identification of aircraft and for improved ground-air liaison.

During HUSKY a number of developments distinctly improved air-ground cooperation. II Corps experimented with mobile fighter-control parties which used a jeep and a VHF radio frequency set; this method of directing fighter-bombers later became SOP during the Italian campaign.<sup>74</sup> GCI's mounted on LST's off the assault beaches proved a most useful innovation; these forward control stations enabled night fighters to operate efficiently and reduced losses from enemy night attacks. Another development was the highly successful use of cub planes in directing artillery fire.<sup>75</sup> Valuable, too, was the experience acquired in the setting up and use of communications between air headquarters, Army headquarters, and the tentacles located with the ground troops.<sup>76</sup>

In the final analysis, any evaluation of tactical operations during HUSKY must necessarily end with the conclusion that an occasional undershot bomb line or plane knocked down by friendly fire was not nearly so important to the campaign or to future operations as the fact that tactical air missions were controlled by the air arm and not by ground commanders and were under a centralized operational control

which kept air power from being frittered away piecemeal and permitted it to use its great qualities of mobility, flexibility, and concentration. It was, indeed, in the Mediterranean that most of the basic principles which governed tactical organization in the European theater and upon which were based the conceptions of air support as it was to be provided throughout the campaign in northwest Europe were originally evolved.<sup>77</sup> Even the airborne operations, unsatisfactory as was their execution, provided experience later put to good use.

In January 1943 the objectives of the Sicilian campaign had been described as follows: to make secure the Allied line of communications in the Mediterranean; to divert Axis strength from the Russian front during the critical summer period; to intensify pressure on Italy. HUSKY accomplished all of these objectives. It accomplished more: it required Germany to extend military commitments into southern France and the Balkans, made Sardinia untenable and threatened Corsica, forced the resignation of Mussolini on 25 July, and led to an Allied-Italian armistice on 3 September.

## CHAPTER 15

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### *INVASION OF ITALY*

**H**ISTORICALLY the invasion of Italy was a sequel to the conquest of Sicily, but from the point of view of grand strategy the two events were widely separated. The Sicilian campaign marked the close of a phase of the struggle against the Axis which had begun with Italy's entry into the war in the summer of 1940. When Messina fell to the Allies they had accomplished the basic aim of clearing the enemy from Africa and opening the Mediterranean to Allied shipping. The invasion of Italy initiated a new and offensive phase of strategy which culminated in the invasion of western France and the final defeat of Germany. But in this new phase, the Mediterranean theater would no longer enjoy a top priority in its claims on men and material; its role would be secondary to operations based on the United Kingdom. If a maximum number of German divisions could be contained, if Italy could be eliminated from the war, and if enough of the peninsula could be brought under Allied control to provide useful bases for strategic air operations against Germany and its satellites, the Italian campaign would have served its purposes.

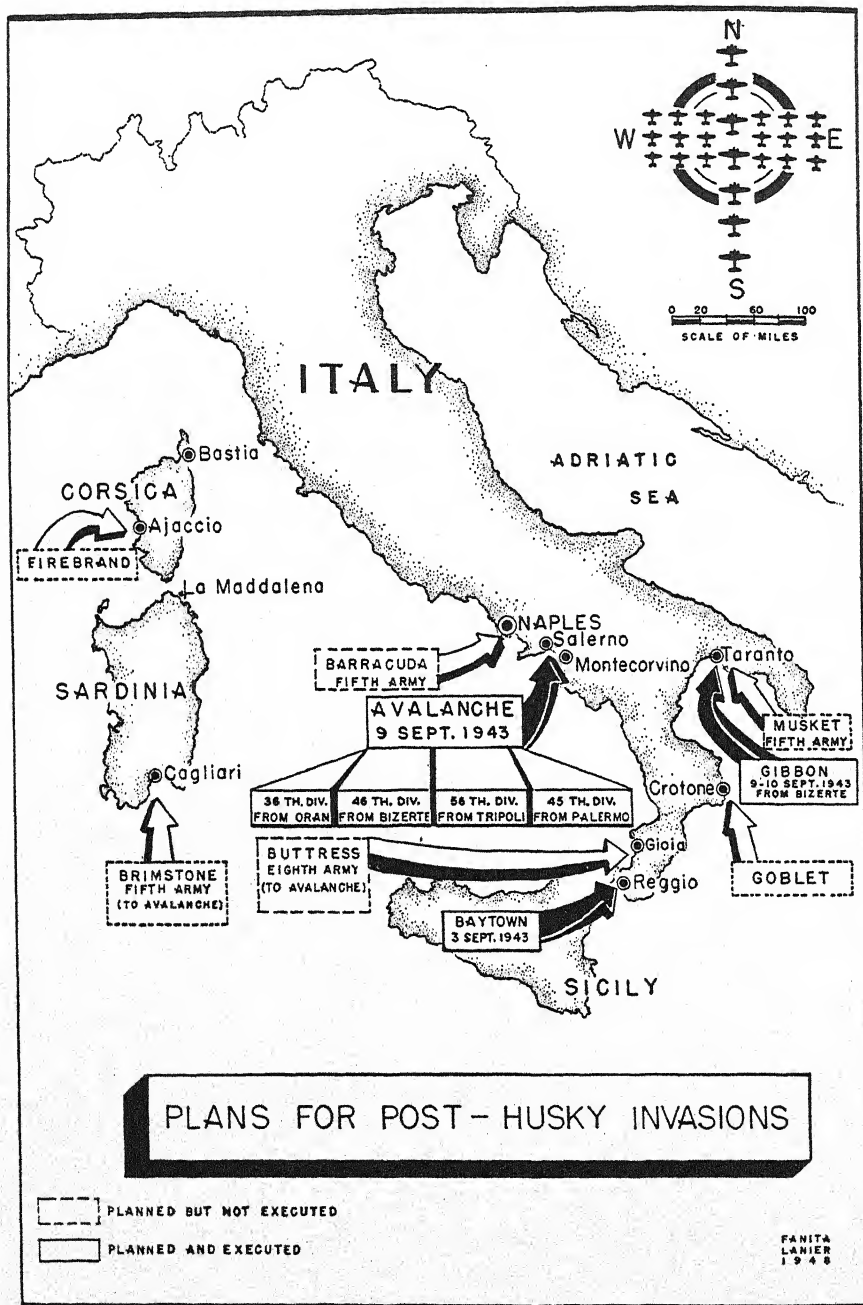
Allied leaders had discussed post-HUSKY strategy at the TRIDENT conference (12-25 May 1943) and the Algiers conference (29 May-3 June) but, failing to come to satisfactory agreements, had decided that General Eisenhower would mount such operations as would be best calculated to force Italy out of the war. During the Pantellerian and Sicilian campaigns, Allied Force Headquarters had prepared a number of preliminary strategic plans with this end in view. Final plans would have to await the end, or near-end, of HUSKY because their nature would be determined in large part by the effect of the Sicilian campaign upon Italian morale and politics and by a number of tactical considerations, some of which could not be accurately fore-

cast: German intentions in Italy, the future size and disposition of enemy forces, the area to be assaulted (Sardinia, Corsica, and the Toe [Calabria] and Heel [Apulia] of Italy each being under consideration), and the amount of landing craft and shipping which would be available.<sup>1</sup>

On 28 June, Eisenhower informed the CCS that if HUSKY were successful but Italian resistance did not collapse he would either invade Calabria (Operation BUTTRESS) and then, if necessary, at a point near Crotone (Operation GOBLET)\* or he would occupy Sardinia (Operation BRIMSTONE). He preferred BUTTRESS but felt that it would be unsound to embark on that venture without enough forces to occupy the Heel and to exploit the invasion as far north as Naples. On 17 July the CCS accepted General Eisenhower's strategical concept and expressed their interest in the possibilities of a direct amphibious operation against Naples. By the 20th it was obvious that Italian resistance to an invasion of Italy would be of minor importance and that the light losses in landing and assault craft, men, and materiel in Sicily would permit such an operation. Eisenhower then ordered planning for BRIMSTONE to cease<sup>2</sup>—a decision buttressed soon by indications that Sardinia would fall of its own weight once the mainland was invaded, thus paving the way for an easy conquest of Corsica by the French. With Sardinia scratched, there remained the task of selecting the specific area on the Italian mainland to be assaulted.<sup>3</sup>

The A-5 section of NAAF, responsible for planning air operations against the Italian mainland, had assembled on 29 June at the Ecole Normale at Bouzarea, near Algiers. There the air planners worked in close cooperation with ground and naval representatives in drafting plans for a number of major amphibious operations.<sup>4</sup> Their efforts enabled AFHQ on 24 and 25 July to circulate two planning papers which suggested an entirely new operation, an amphibious landing in the Naples area (Operation TOPHAT). The assault, replacing a contemplated invasion of the Heel (Operation MUSKET), would go ashore on the Salerno plain as a follow-up to an earlier landing on the Toe. "The key factor in the operation would be air protection," said the paper; therefore, the early capture of an airfield would be essential, and Montecorvino airfield, capable of taking four fighter squadrons, was suitably located.

\* See map, p. 490. Under this plan BUTTRESS was scheduled for 1 September and GOBLET for 1 October.



If successful, TOPHAT would give the Allies the city and port of Naples, capable of maintaining all forces which could be put into Italy in 1943, and would thereby pose a definite threat against Rome. The operation would lighten pressure on BUTTRESS troops moving up from Calabria and would force enemy troops in the Heel to withdraw or risk annihilation. Control over the Naples area would give the Allies a number of airfields from which to expand the air offensive against Italy, central Europe, and the Balkans.

The hazards involved were considerable. Indeed, until BUTTRESS columns had taken the five fighter fields below the line Amendolara-Belvedere, the venture could hardly be risked. Axis ground forces could rapidly converge on a Salerno beachhead. On airfields in the Naples and Foggia areas, uncomfortably close, there were by Allied estimates some 600 German and Italian day fighters, 50 German night fighters. There was no major port below Naples through which the assault could be supported. Within the Naples area, beaches north of Salerno were unsatisfactory for an assault and out of effective range of NAAF's single-engine fighters; southward from Salerno to Paestum good beaches were hemmed in by near-by mountains which would restrict movement on and out of the coastal plain—artillery sited on the heights could command the whole area. In the last analysis, the decisive argument in favor of the Salerno plain was that the Allies could land no farther north under fighter cover.<sup>5</sup>

Sensible of these arguments, the CCS were inclined to favor the Salerno operation—henceforth called AVALANCHE. They promised to reinforce its air contingent with one heavy and four escort carriers, thereby reducing what appeared to be the greatest hazard to the proposed operation—insufficient fighter cover over the beaches.<sup>6</sup> By 10 August, Eisenhower had decided to invade Italy early in September, with separate but coordinated strikes against Calabria and the Salerno area. About the former operation there had been little question; it involved only a short passage across the Strait of Messina under ample fighter protection and an assault on a coast line without strongly prepared defenses or adequate airdromes. As for AVALANCHE, developments during July and the first week of August argued strongly for an invasion as close to Rome as possible. The downfall of Mussolini to which the Allied air raid on Rome on 19 July had contributed heavily, the accelerated progress of the Sicilian campaign, signs that Italy could not continue to prosecute the war and that she was about ready to sue



for peace, the lessening of the naval and air capabilities of the Germans in the Mediterranean, and an increase in Allied strength—all combined to convince Anglo-American planners that an invasion in the Naples area, but not a direct assault on Naples itself, had a better-than-even chance of success.<sup>7</sup>

After 10 August, then, Eisenhower had only to determine the exact nature of the landing on the Toe. Two operations had been planned: BUTTRESS to be mounted from North Africa; BAYTOWN from northeastern Sicily. On 16 August, Eisenhower informed his commanders that BAYTOWN would be launched between 1 and 4 September and that the Salerno area would be assaulted on 9 September. On 19 August he announced that BUTTRESS was canceled and AVALANCHE was being mounted.<sup>8</sup>

The President, the Prime Minister, and the CCS, currently meeting in the QUADRANT conference at Quebec, approved these decisions. The leaders also looked beyond the assault phase to consider over-all plans for future operations in the European and Mediterranean theaters. Their most important decision was that OVERLORD (the cross-Channel invasion of Europe in 1944) and POINTBLANK (the CBO) were to have first priority in allocations. The Mediterranean, having profited by diversions from BOLERO since the acceptance of TORCH, must now resign itself to a secondary role as troops and materiel were poured into England for the cross-Channel push. It would have to carry out its three-way mission of forcing the collapse of Italy, creating diversions of enemy forces, and destroying vital installations on the continent without top priority on men and supplies.<sup>9</sup> On the very eve of BAYTOWN-AVALANCHE, the Allies' first invasion of continental Europe, the decision had been taken which was to fasten on Italian operations the designation of "the forgotten war."

### *BAYTOWN and AVALANCHE Plans*

BAYTOWN, scheduled for 3 September, was to be essentially a British affair, employing the Eighth Army's 13 Corps, with the predominantly British Desert Air Force providing air cooperation. Two divisions would be moved across the narrow Strait of Messina and landed at Reggio and Gallico/Catona where Axis defenses were believed to be weak. The immediate objectives of the ground troops were Reggio and near-by airfields; later, they were to sweep northward for a junction with the right wing of AVALANCHE and to fan out

toward the east for a link-up with other British forces which were to be landed near Taranto between D plus 2 and D plus 7 in Operation GIBBON-SLAPSTICK.

Up to D minus 7 the Allied air forces were to pave the way for BAYTOWN by neutralizing attacks on enemy airfields. From D minus 6 through D minus 1 they would isolate the assault areas, interdict enemy movements into them, and reduce defense positions. Night fighters would cover the assault convoys. On D-day DAF would furnish fighter cover over the assault areas and Tactical would handle close air action.\* Subsequent air operations would follow the usual patterns—preventing the enemy air forces from interfering effectively with the ground troops, hitting Axis concentrations, and giving direct assistance to the Eighth Army.

DAF would exercise operational control over Tactical Bomber Force under the direction of TAF through D-day; thereafter, DAF would retain only the 47th Bombardment Group (U.S. A-20's) and the 232 Wing (RAF Baltimores) for coordination with the Eighth Army as it advanced through Calabria, turning over to XII Air Support Command for use in AVALANCHE the remaining units of TBF. The U.S. 57th and 79th Fighter Groups were assigned to DAF under a similar arrangement. DAF, along with Headquarters, Malta, would be responsible for the protection of any convoys which might move along the south and east coasts of Sicily during AVALANCHE.<sup>10</sup>

The AVALANCHE operation would be more complicated. The plan called for the Fifth Army to seize Salerno and the airfield at Montecorvino, then to capture Naples and secure the airfields near by. The American VI Corps (Maj. Gen. Ernest J. Dawley commanding) and the British 10 Corps (Lt. Gen. Sir Richard L. McCreery) were to initiate the invasion by simultaneous attacks on the beaches between Salerno and Paestum† on 9 September. Total strength of the invading and follow-up troops was 125,000; these would face enemy forces estimated at 39,000 on D-day but capable of being increased to more than 100,000 by D plus 3. Maintenance for the troops was to be supplied

\* Tactical planned to devote 100 per cent of its effort on D-day to direct support; on D plus 1 through 3 only 40 per cent would go to direct support, with 60 per cent assigned to communications and airfields; on and after D plus 4 the ratio would be 20 to 80.

† The Salerno plain, shaped rather like a half-moon, is 21 miles long and 8 miles deep in the center.

primarily over the beaches until the port of Naples had been made available.<sup>11</sup>

The Western Naval Task Force under Vice Adm. H. K. Hewitt was to transport VI and 10 Corps to their beaches, while its diversion group was to make a feint against the beaches north of Naples to draw off enemy forces. Its support carrier force, one carrier and four escort carriers, was to supply fighter protection to the naval forces and assist the Sicily-based fighters of XII Air Support Command to control the air over the beaches.<sup>12</sup>

For the air planners the most serious problem was to provide fighter cover over the beaches, which were barely within range of Sicily-based fighters but were within easy reach of Axis airfields around Naples and Foggia. Salerno was 226 miles from Trapani, 224 from Gerbini, 178 from Messina. Fighter radius, allowing ten minutes of combat and using an auxiliary tank, was as follows: P-38, 350 miles; A-36, 200 miles; Spitfire, 180 miles; P-39 and P-40, 150 miles; Beaufighter, 300 miles. P-38's could reach the assault beaches and remain over them for an average of one hour (including ten minutes of combat), A-36's could stay for thirty minutes, and Spitfires for twenty minutes. Beaufighters, operating from Gerbini, could provide protection at night over the beaches and the offshore shipping. P-39's and P-40's could be used only for duty near Sicily. Fighter cover for AVALANCHE, even under the most favorable conditions, would be limited. Two threats to efficient operation of the Spitfires—a shortage of 90-gallon tanks and of airfields in the Messina area—proved worse in anticipation than in actuality. Eighteen hundred additional tanks arrived in time, and during the first week of the invasion fewer sorties than had been planned were necessary; fast work by aviation engineers and careful scheduling of operations solved the airfield problem.<sup>13</sup>

AFHQ's concern over fighter cover for the assault was increased by the fear that NAAF might not have enough bombers and fighters to neutralize the enemy's air arm and disrupt his lines of communication. The long and strenuous Tunisian campaign and the intensive efforts required during HUSKY had thinned out and worn down both crews and planes. General Eisenhower tried to increase his bomber force by a short-term loan from the Eighth Air Force. His first request was for several groups of B-17's, but Devers and Eaker strongly opposed the request on the ground that even a temporary transfer would seriously impair the Eighth's participation in the Combined Bomber Offensive

and the antisubmarine campaign at a critical period. The CCS refused Eisenhower's request. He then asked that the three B-24 groups from the United Kingdom which had bombed Ploesti be left in the Mediterranean. Although Eisenhower declared that without them he would be "skating on very thin ice" and Tedder considered it most important that they be retained, General Arnold returned the groups to the United Kingdom on the ground that the Eighth had to destroy most of the German fighter factories before the onset of bad weather. A third request—for the loan of four groups of mediums from the United Kingdom—was turned down by General Marshall. In all three instances, the rejections may have been based in part upon the belief that combat crews did not operate at maximum efficiency when separated from their ground echelons.

A suggestion by Spaatz, supported by Eisenhower, to increase NAAF's striking power by re-equipping at least one medium bomber group with B-17's also was rejected because AC/AS, Plans believed that the conversion would delay the build-up program of the Eighth as well as deprive General Eisenhower's ground forces of needed tactical cooperation. Then, a few days before the launching of AVALANCHE, the theater was informed that it would receive no more P-38's until October. NAAF especially needed Lightnings, which had proved extremely valuable in such diverse activities as escorting bombers and convoys, covering assault areas, cooperating with ground troops, cutting lines of communication, and destroying transport. Spaatz considered the plane to be "in a class by itself." The loss rate (sixty in August and twenty-four in the week ending 5 September) already exceeded the number of available replacements, and less than 250 were currently on hand.<sup>14</sup>

It began to appear that Air Chief Marshal Tedder had had a clear picture of the situation when he informed General Spaatz on 31 July that the air forces which he would have at his disposal would have to come from the resources already permanently allotted to NAAF.<sup>15</sup> Those resources were increased by the subsequent decision to close out the operations in the Mediterranean of the Ninth Air Force as a separate force. On 22 August the 57th, 79th, and 324th Fighter Groups (P-40's) were transferred from the Ninth to XII Air Support Command, and the 12th and 340th Bombardment Groups (B-25's) to XII Bomber Command; effective 23 August the 316th Troop Carrier Group (less the 37th Squadron) went to XII Troop Carrier Command. Between

23 and 26 August seven air service command units were transferred. Personnel involved in the shift totaled 1,300 officers and 7,000 enlisted men, all of whom with their units passed for administrative purposes to the Twelfth Air Force. But these units, actually, had been operating with NAAF since before the invasion of Sicily, as indeed for all practical purposes had been the case with the 98th and 376th Bombardment Groups (H) which now with the 37th Troop Carrier Squadron and eight supporting units (a total of 700 officers and 6,200 enlisted men) were promised to the Twelfth as soon as that force was ready to move its heavies to forward bases. Thus did the AAF on the eve of Italy's invasion take steps for a consolidation of its units in the Mediterranean that put a period to the service of the Ninth Air Force in that area.<sup>16</sup> Reconstituted in the United Kingdom in October, the Ninth prepared itself for a major role in the invasion of western Europe.\*

Eisenhower also added to his air strength 320 Waco gliders (CG-4A's) and 50 Horsas. The former were shipped to the Mediterranean from the United States and erected by XII Air Force Service Command; the latter were towed to the theater from the United Kingdom by the RAF 38 Wing. These additions gave NAAF a total of some 700 Wacos and 60 Horsas, enough to take care of planned operations. Finally, the British chiefs, concerned over Eisenhower's air strength, agreed to leave with him the three squadrons of Wellingtons which had been loaned to the theater for HUSKY.<sup>17</sup>

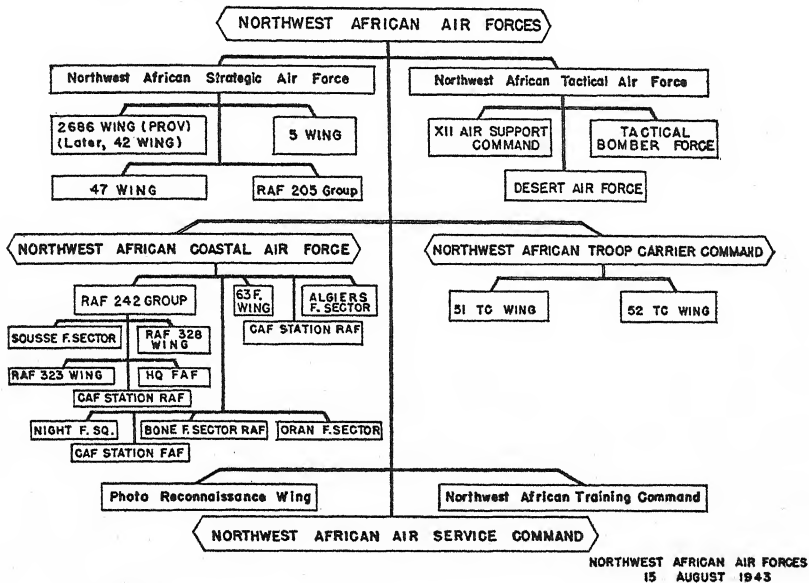
Eisenhower having decided to launch AVALANCHE whether or not the theater received additional air strength,<sup>18</sup> NAAF's A-5 section prepared the air plan, long in advance of D-day, in terms of aircraft actually available. The finished product was complex, as must inevitably be the case in large-scale amphibious operations involving the cooperation of so many services and organizations. The features of the air plan may be analyzed here in somewhat more detail than has been usual in this volume as an illustration of the vast amount of staff work entailed in modern warfare.

NAAF's first major tasks would be to neutralize enemy air forces by bombardment, then to prevent or retard the movement of enemy reinforcements into the combat area.<sup>19</sup> Assuming that 75 per cent of its planes would be serviceable, NAAF would have for these duties 346 heavies, 388 medium day bombers, and 122 medium night bombers—856 bombers in all.<sup>20</sup>

\* See below, pp. 642-43.

## INVASION OF ITALY

The third major task was to provide air protection over the assault convoys, the assaults, and subsequent operations. Coastal Air Force was to protect the AVALANCHE convoys from the time they left the normal routes up to last light of D minus 1, when the responsibility would pass to Tactical Air Force. For carrying out its assignment Coastal had some 850 aircraft, of which 372 were RAF planes attached from the Middle East and India, 149 were in the French air force (which with Anglo-American assistance had been re-created and soon



would be ready for action), and the remainder were day fighters and night fighters of the Twelfth Air Force.\* The number of planes was more than enough for the single job of protecting the assault convoys—but CAF had many other responsibilities, its operations extended from Casablanca to Messina and over thousands of square miles of ocean, and a large number of its planes were types such as Swordfish, Dakota, Walrus, and Albatross, none of which was suitable for convoy duty. Eisenhower felt that Coastal's forces were inadequate for its several tasks and, in spite of objections from both the British and the U.S. Navy, strengthened it with the 1st Anti-Submarine Squadron (B-24's)

\* USAAF units were: 52d, 81st, 350th Fighter Groups (day); 414th, 416th, 417th Fighter Squadrons (night). The 415th Fighter Squadron (night) was assigned to TAF for AVALANCHE.



which had been operating under the Navy at Port Lyautey in French Morocco.<sup>21</sup>

On and after D-day, Coastal would protect shipping to within forty miles of the beaches, and Tactical would be responsible beyond that point. TAF was to furnish cover for the inshore convoys by employing two squadrons of P-38's and one each of A-36's and Spitfires; in addition, one squadron of Seafires would operate over the northern end of the assault area. Patrol would be constant from 0900 to 1950 hours, with from four to forty aircraft over the shipping at all times.<sup>22</sup>

The most difficult air task, furnishing air cover for the assault and for subsequent ground operations, fell to XII Air Support Command.\* The job of protecting the ground troops would fall upon three groups of U.S. P-38's (from Strategic), two of U.S. A-36's, one of U.S. Spitfires, and eighteen squadrons of RAF Spitfires. Four squadrons of Beau-fighters would handle defense of the area at night. It was intended that the P-38's and Spitfires each would fly two sorties per day, which, with the A-36's and Navy Seafires, would give an average of fifty-eight planes constantly over the beaches during the daylight hours of D-day and a total of close to 1,000 sorties per day. One group of P-38's was to be especially trained to fly in darkness so that it could take off before dawn and return to base after dark.<sup>23</sup>

With 75 per cent serviceability, there would be available for cover over the beaches and offshore shipping around 322 single-engine fighters, 206 twin-engine fighters, 32 night fighters, and 110 carrier-based Seafires, a total of 670 aircraft. The number was sufficient provided the German and Italian air forces did not react sharply and persistently; if they did, the number might well be insufficient in view of the limited time that each plane could stay over the beaches and because the length of the patrol was certain to result in early pilot fatigue. For these reasons it was recognized from the beginning that the first major objective of the ground forces must be Montecorvino airfield, three miles inland from the invasion area and ten miles below Salerno, and that aviation engineers would have to go ashore immediately behind the ground troops for the purpose of constructing landing strips in the Paestum sector.<sup>24</sup> Fighter planes would immediately begin oper-

\* USAAF units were: 27th, 86th Fighter-Bomber Groups; 31st, 33d, 324th Fighter Groups; 99th Fighter Squadron (Separate); 111th Observation Squadron.

ating from these strips. As other fields, especially those in the Naples complex, fell to the Allies, the build-up would continue.\*

The planes of XII Air Support Command would be directed during the assault period by a fighter director control on board the USS *Ancon*, flagship of the commander of the Western Naval Task Force. Maj. Gen. Edwin J. House, commanding XII ASC, and thirteen officers and forty-two enlisted men were to comprise the control group. HMS *Hilary* would serve as the auxiliary fighter control ship, with USS *Samuel Chase* as stand-by. As soon as fighter squadrons were based on the mainland the control personnel would go ashore and direct subsequent operations from the headquarters of XII ASC, which would be located as close as possible to Fifth Army headquarters.<sup>25</sup>

The 111th Observation Squadron was placed under the control of XII ASC for reconnaissance both planned and on call; the squadron's planes were to report to the *Ancon* while returning from their missions and to XII ASC (Rear) in Sicily after landing. Ground troops which found themselves in need of direct support by fighters and fighter-bombers would send their requests through their divisional headquarters, which would pass on the request to Air Support Control, Headquarters, XII ASC. Tentacles were set up in various brigades and divisions for the purpose of communicating with the *Ancon*. Thorough plans for air-ground recognition, including markings and signals, were worked out.<sup>26</sup>

Air-Navy liaison was established by assigning three naval officers from the Western Naval Task Force to XII ASC. One officer was to train P-51 pilots in spotting procedure; the other two were to act on requests from naval sources for fighter cover and calls for spotting planes.<sup>27</sup>

NAAF's fourth major task was to transport and drop whatever airborne troops General Eisenhower might decide to use during and after the assault period. In anticipation of its employment the 82d Airborne Division moved from Sicily to Kairouan, Tunisia, for re-equipping and

\* On the assumption that Montecorvino would be taken on D-day or D plus 1, it was planned to fly in, not later than D plus 6, 12 squadrons of U.S. Spitfires, P-40's, and A-36's, 8 squadrons of RAF Spitfires, and one-half squadron of night fighters. When established ashore these 20½ units would be under the control of the air support command's 64th Fighter Wing. By D plus 28 (7 October) there would be on the mainland 36 squadrons of single-engine fighters, 7 of light bombers and fighter-bombers, 8 of medium bombers, and 5 of Coastal's planes, a total of 56 squadrons. By mid-December virtually all of NAAF's combat aircraft were scheduled to be based in Italy.

training; and the 51st and 52d Troop Carrier Wings initiated refresher courses in night formation flying, glider training, and parachute infantry dropping. During the last week of August the two wings flew special night training flights out of Tunisia in which the courses, distances, drop zones, landing zones, and objectives simulated those of the actual AVALANCHE airborne operations. Between 2 and 6 September the troop carrier units moved themselves and the combat echelon of the 82d to southern Sicily.<sup>28</sup>

NAAF also was ready well ahead of D-day to carry out its half-dozen secondary tasks. The majority of these jobs were the responsibility of Coastal Air Force, which was to defend the territory held by the Allies (except on the eastern coast of Sicily where Desert Air Force had the responsibility), including cities, ports, airdromes, and military installations; protect the regular Mediterranean convoys; attack Axis convoys and naval units (with which job Strategic would assist when feasible); conduct antisubmarine reconnaissance and strikes; and handle air-sea rescue in the central and western Mediterranean. All of these tasks had long been the normal responsibility of Coastal, so that except for a broadening of air-sea rescue facilities no special preparations were necessary.<sup>29</sup>

NAAF's other jobs were to meet requirements for air transportation, other than for airborne troops, and to conduct strategic and tactical reconnaissance. Air transportation was primarily under the supervision of XII Air Force Service Command, which handled the movement by air of all Air Corps passengers and freight and controlled the Ferry Pilot Service which delivered aircraft to depots and combat units. Northwest African Air Service Command was responsible for setting up missions, whether for ferrying or for the movement by air of passengers and freight. Finally, on 26 August, AFHQ announced that, if possible, other air transport services would be made available for both invasions: emergency service for the dropping of supplies by parachute; emergency delivery of supplies to an airfield in the BAYTOWN area; regular delivery of ordnance stores; evacuation of casualties. For handling these transport services there were in all twenty-nine squadrons of Troop Carrier Command and two U.S. squadrons and one RAF squadron of NAASC. To facilitate operations an advance control was to be established alongside headquarters of XII ASC.<sup>30</sup>

Except for the limited amount of tactical reconnaissance assigned to the 111th Observation Squadron, photo reconnaissance was wholly the

responsibility of the Northwest African Photographic Reconnaissance Wing. Its share in the invasion had begun even before the operational plans had crystallized. With a single seven-squadron group,\* the 3d (scheduled to be reinforced by the 5th Group in September), NAPRW had flown more than 1,100 sorties during the three summer months. Vertical photos of the two invasion areas had been enlarged for detailed study, and low obliques, annotated and consolidated into a schematic map, had been printed and distributed to ground force units down to battalion level.<sup>31</sup>

Basic to any air force operation, and especially important in the launching of an invasion, was the work of the air service command. XII AFSC supplied the U.S. air forces with gasoline and bombs; built, improved, and maintained airfields; administered airdromes and took care of housekeeping; provided repair and maintenance for aircraft; and handled the 500,000 different items of Air Corps supply. It assembled the hundreds of replacement fighter aircraft which were brought into the theater on shipboard. Its erection points, using the American assembly-line, mass-production methods, put together the CG-4A gliders which would be used during the invasion, erecting 573 between the middle of May and the end of August. This was all non-combat, behind-the-line-of-scrimmage work; it went on from Marrakech and Casablanca to Sousse and Messina, at great airdromes like Maison Blanche outside of Algiers and at little bomb dumps in wayside olive groves, in the Atlas Mountains and the wastes of southern Tunisia, in cities like Bizerte and on tiny islands such as Gozo. The work was never spectacular and seldom exciting, but without it no airplane dropped its bombs on Axis installations or shot down raiding enemy aircraft above Allied ground troops.<sup>32</sup>

But XII AFSC also was to participate directly in AVALANCHE. A detachment from III Air Service Area Command (that one of the three subcommands of XII AFSC whose area of operation was the most advanced) and subordinate signal, ordnance, quartermaster, and engineer units were to go ashore immediately behind the assault troops. These men were to construct temporary landing strips, repair Montecorvino airfield, and move air force supplies from beaches to dumps and from dumps to airfields so that the fly-in squadrons of fighters would be able

\* The squadrons were: 5th, 12th, 15th, 23d (U.S.); 682 (RAF); 60 (SAAF); 2/33 (FAF).

to operate at the earliest possible moment. It was planned to have some 3,500 air service troops ashore by D plus 15.<sup>33</sup>

Happily, in the midst of so much planning and the constant air operations which accompanied it, it was not necessary for the air forces to go through the ordeal of an internal reorganization. The structure which had grown out of the establishment of NAAF in February 1943 had been thoroughly tested in the last two months of the Tunisian campaign, in the conquest of Pantelleria, and during the Sicilian campaign and had proved to be satisfactory. Within the Twelfth Air Force the only notable organizational development between 15 May and 30 August was the activation on 6 June of a new bombardment wing, the 2686th Medium Bombardment Wing (Prov.), which on 25 August became the 42d Bombardment Wing. This gave XII Bomber Command three wings with units divided among them in strict accordance with type of aircraft, plus fighter planes to serve as escort: the 5th Bombardment Wing with B-17's, the 42d with B-26's, and the 47th with B-25's.<sup>34</sup>

The most important administrative development prior to the invasion of Italy came on 1 September when, pursuant to NAAF General Order No. 166 dated 26 August 1943, all administrative functions of the USAAF elements of NAAF were returned to the respective commanding officer of each Twelfth Air Force echelon. Each USAAF unit of NAAF was assigned (or attached) to the corresponding Twelfth Air Force organization, which assumed the administrative function of the NAAF organization to which the unit had been and continued to be attached for operational control. For example, XII Bomber Command took over the administration of all USAAF units of NASAF. The change did not affect the administrative control of RAF elements nor the operational control of USAAF or RAF units; thus, NASAF continued to control all operations of XII Bomber Command and RAF 205 Group.

This order, in effect, re-established the Twelfth Air Force as an active headquarters after it had existed "in name only" since the previous February. It was re-established, however, purely as an administrative agency; personnel now operated in a dual capacity: operationally as NAAF, administratively as Twelfth Air Force.<sup>35</sup>

*Air Prelude to Invasion*

While the Allies were putting the finishing touches to these administrative changes and to the elaborate and complex plans and preparations for BAYTOWN and AVALANCHE—that is, from 18 August through 2 September—the air forces already had been paving the way for the two invasions. To be sure, Tactical Air Force had operated on a very limited scale. Its units, especially fighters and fighter-bombers, were engaged largely in regrouping, reorganizing, refitting, and resting in preparation for the intensive operations which would begin when BAYTOWN was launched.<sup>36</sup> Strategic, however, had steadily smashed at Italian cities, port facilities, marshalling yards, airdromes, rail and road bridges, and other installations. For the heavies and mediums and their fighter escort and for the ground crews which serviced them there was never a break between campaigns; their operations were continuous, knowing neither beginning nor end.

The outline air plans for AVALANCHE and BAYTOWN provided that up to 2 September Strategic would attack enemy airfields in southern and central Italy with sufficient strength to prevent effective build-up and to force the enemy to move his air units to more northerly fields, thereby neutralizing the Axis air force for operations against BAYTOWN and AVALANCHE. When this requirement had been met, the remaining available air effort was to be directed against enemy communications and other suitable targets, the attacks being designed to retard the movement of reserves into the assault areas and to isolate the battlefields.<sup>37</sup> Actually, Strategic already had gone far toward realizing its two principal objectives before the end of the Sicilian campaign permitted it to throw its full weight against the mainland. It has been noted above\* that bombers of the Ninth Air Force had attacked Italy as early as 4 December 1942, that the Twelfth had joined in the attack in April 1943, and that after the Tunisian campaign the assault had been continued on an increasingly heavy scale throughout HUSKY. By 17 August thousands of bombs had fallen on key cities, marshalling yards, harbors, bridges, airfields, and other installations; the assault had built up an accumulation of destruction which already had reduced sharply the strength of the German Air Force, limited the movement of reinforcements and supplies into southern Italy, hurt the morale of the Italians, and reduced the over-all Axis war strength.

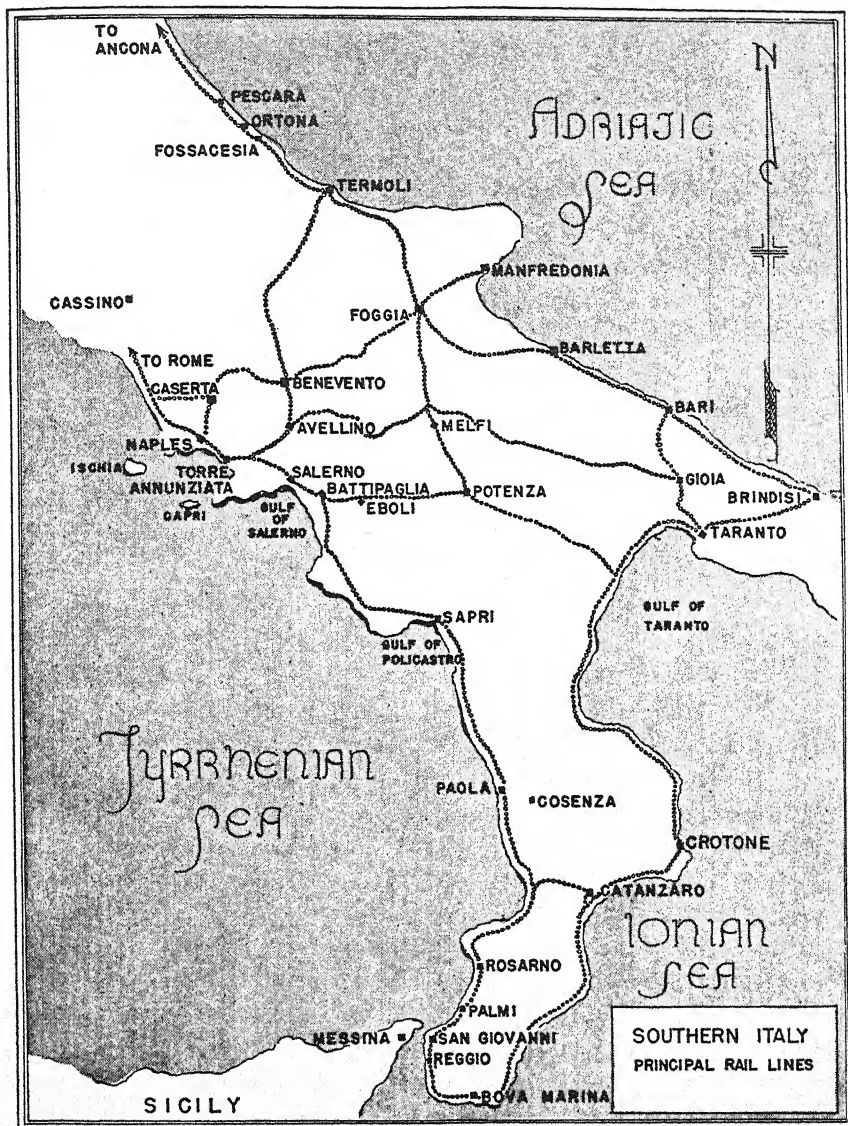
\* See above, pp. 95-96, 184, 419.



Actually, Strategic's steady attacks on Italian airdromes during the summer had resulted by 18 August in the neutralization of virtually all of the more important airfields in southern Italy with the exception of Foggia and its satellites, so that from the end of the Sicilian campaign to the launching of BAYTOWN, SAF directed almost all of its major assaults against marshalling yards and railroad junctions and stations. Marshalling yards in southern Italy constituted an unusually good type of target. From Naples south there were only ten yards (excluding those on the Heel, which were of no strategic importance) and only four shops—one major and three minor—for repair and maintenance of locomotives.<sup>38</sup> The greater part of the supplies which supported the Axis forces in southern Italy came down the narrow "boot" from the northern part of the peninsula, whether they originated in Germany, as did, for example, 95 per cent of the oil and 80 per cent of the coal, or in the Po Valley, which contained three-fourths of Italy's industrial installations.<sup>39</sup> In moving southward the supplies passed through one or more of three bottlenecks: Rome, Naples, and Foggia. If marshalling yards at those points could be smashed the transportation of Axis men and materiel down the Tyrrhenian coast to Calabria and down the Adriatic coast to Apulia would be seriously handicapped. The yards at Rome and Naples already had been hit hard, but the one at Foggia, although damaged, was in full operation. In the last weeks before the two invasions it remained to knock out Foggia and wreck the rail lines from Rome to Naples, Naples to Foggia, Naples to Salerno, and Salerno to the Gulf of Taranto, with some attention being paid to a few key spots north of Rome.

It was decided that Strategic would attack targets above a line Sapri-Trebisacce, with the Ninth taking care of the Heel and Tactical working on the Toe. Under this plan, from 18 August through 2 September NAAF's U.S. heavies flew almost 1,000 sorties and its mediums (both Strategic and Tactical) flew close to 2,000 against the enemy's lines of communication. By the time AVALANCHE was launched, NAAF's total post-HUSKY operations against communications, including those by RAF as well as USAAF planes and fighter-bombers as well as heavies and mediums, had grown to more than 4,500 sorties with around 6,500 tons of bombs dropped.<sup>40</sup>

The heaviest attack of the period<sup>41</sup> was against Foggia on 19 August; 162 Fortresses and 71 Liberators hit its yards with 646 tons of bombs, and Wellingtons came in to attack that night. In spite of some sharp air



opposition which cost the heavies five B-17's (flak damaged another seventeen) the bombers cut the lines to Naples, Manfredonia, and Bari, scored numerous hits on the yards and on near-by factories, inflicted considerable damage on locomotive and repair shops and on rolling stock in the freight sidings, and severely damaged the city's electric substation. When the British Eighth Army entered Foggia on 28 September it reported that this attack, together with later bombings, had been "most effective" and that the damage surpassed all earlier estimates.<sup>42</sup>

The second heaviest attack was on Pisa, delivered on 31 August by 152 B-17's, which dropped more than 450 tons of bombs on the yards, an aircraft factory, a gas works, and other industrial targets. The attack cut rail lines to Leghorn and Vada and caused widespread destruction. Other major attacks by heavies were on Sulmona, Terni, Bologna, Cancelli, and Pescara, while small raids were carried out against yards at Aversa, Orte, Bari, and Foggia, yards and shipping at Taranto, and the supply line through the Brenner Pass which ran from Innsbruck, Austria, to Bolzano and Verona. The last raid, 2 September, was effective out of all proportion to the number of planes involved. Twenty-four B-17's destroyed the bridge across the River Iscara and cut the only other line running south (from the pass to Merano), thereby blocking all traffic from Germany to Trento; the same day nineteen other Fortresses cut the Trento highway bridge and the adjoining bridge over the Adige River. The Brenner route was the shortest, most direct line between Germany and Italy, and its interdiction, although temporary, was valuable to the Allies.

Most of the heavy bomber sorties were by planes of XII Bomber Command. But IX Bomber Command ably supplemented them; its outstanding mission was on 21 August against Cancelli, where its planes not only severely damaged the yards but shot down 22 enemy fighters. During the period, Liberators and Halifaxes of RAF, Middle East went out against the Crotone yards in small-scale attacks which were effective in disrupting activity. Mediums worked principally on marshalling yards and industrial installations in southern Italy. B-25's of Strategic and B-26's of Strategic and Tactical attacked by day, Wellingtons by night. The most popular target was Salerno, whose yards were bombed on five different occasions by a total of 139 Wellingtons and 112 U.S. mediums. Torre Annunziata was hit three times by a total of 126 Wellingtons and 51 U.S. mediums. Battipaglia took the third

hardest pounding, from 54 Wellingtons and 107 B-25's and B-26's. Other yards which were struck by bombs from more than 100 effective sorties were Aversa, Bagnoli, Cancelli, Caserta, and Villa Literno, all in the Naples area; Benevento, northeast of Naples; Taranto; and Civitavecchia. The yards at Catanzaro and Sapri also were hit hard.

There were no large-scale light bomber attacks on communications, the heaviest effort against a single target being a series of raids on 27 and 28 August by a total of fifty-eight RAF and SAAF planes against Lamezia rail and road junction. Fighter-bombers were more active. Twelfth Air Force A-36's attacked rail and road junctions at a half-dozen points and marshalling yards at three, all in Calabria; after bombing they usually strafed trains and transport vehicles. P-40's attacked bridges, motor transport, and barracks. At night, Malta-based Mosquitoes bombed and strafed trains, road traffic, and railway stations on a small but highly successful scale.

Allied reconnaissance planes reported on the eve of BAYTOWN that NAAF's assault had blocked communication lines and stopped all rail traffic at Pisa, Sulmona, Cancelli, Aversa, Benevento, Foggia, Salerno, Paola, and Catanzaro and had reduced Rome's Littorio yard and that at Battipaglia to limited activity. Movement by rail south of a line Naples-Foggia was practically at a standstill. In addition, the attacks had wiped out large quantities of rolling stock. The destruction of rail communications forced the enemy to rely increasingly on road transport into southern Italy. This not only withdrew transport vehicles from other areas and other fields of activity and put an additional strain on fuel reserves but the limitations of road transport as compared to rail made the enemy's problem of supply increasingly difficult.<sup>48</sup>

As noted above, a blitz on enemy airfields such as had preceded the Sicilian campaign was not necessary as a prelude to the invasion of Italy, for the back of the Axis air forces already had been broken. It was necessary only to give the fields around Foggia a thorough going over and to hit again any already damaged field which began to show signs of renewed activity. On 25 August, 140 SAF P-38's swept over the Foggia complex on the deck, strafing grounded aircraft and road and rail transportation; then 136 B-17's, escorted by other Lightnings, dropped 240 tons of 500-pound GP and 20-pound fragmentation bombs in the space of thirty minutes on satellites 2, 4, 7, and 10. Besides wreaking havoc among the airfield buildings, the attack destroyed at least forty-seven enemy planes and damaged thirteen. The blow may



well have been a major event in the air war in the Mediterranean, for thereafter there was a sharp decline in the number of Allied bombers lost to enemy fighters.

Fortresses also pulverized the fighter base at Capua and hit the bomber base at Viterbo with good results. Liberators of the Ninth got in one attack against airfields, striking Bari airdrome; and RAF Halifaxes from the Middle East flew a few sorties against Grottaglie in the Heel. U.S. B-25's and B-26's chimed in with a large-scale raid on the Grazzanise fighter base and a small attack on Crotona airfield.

In addition to the two major objectives, lines of communication and airfields, NAAF's planes paid some attention to enemy shipping, sinking one vessel and damaging seven. Successes were far fewer than during the Tunisian and Sicilian campaigns, for the enemy now was reinforcing only two outlying positions, Corsica and Sardinia.

Although the air attacks on mainland objectives were delivered as a preliminary to two separate and distinct invasions, the greater part of the attacks served to prepare the way simultaneously for both invasions. Thus, the smashing of lines of communication in and near Naples and the battering of the airfields around Foggia were as valuable to BAYTOWN as to AVALANCHE. However, it was necessary in the week immediately preceding BAYTOWN to conduct a special series of attacks against enemy positions in Calabria, especially in the vicinity of Reggio, in order to minimize the ability of the Axis to interfere with landings in that area. This phase of the air effort was handled by escorted light bombers of Tactical—U.S. A-20's and RAF and SAAF Bostons and Baltimores—supplemented on occasions by U.S. B-25's. Principal targets were gun positions, fortified positions, troop concentrations, and army headquarters. The attacks were limited in number and size, and there was no attempt at saturating the area. A more concentrated assault would have disclosed the exact spot at which the landings were to be made; moreover, air reconnaissance and two commando landings had revealed that enemy defenses in the area were weak.<sup>44</sup>

During the period from 18 August through 2 September the enemy's opposition to bombers and fighters of Strategic and Tactical was spotty to the point of being unpredictable, except around Naples and Foggia where it was generally strong and aggressive.<sup>45</sup> Even there, the defensive fighter effort was not always consistent, apparently because the enemy was unable to cope adequately with more than one bomber formation at a time. Bombers which went unescorted into central and northern



Italy were attacked on some occasions and on others were left entirely alone. Fighter-bombers ran into opposition on about half of their sorties, but night bombers were not bothered. Reconnaissance planes, on the contrary, were constantly harassed by both aircraft and flak. It was evident in the last few days before BAYTOWN that the enemy had concentrated his fighter strength, his best pilots, and his heaviest AA defenses in the Naples sector; part of this increase was at the expense of Calabria, from which all but a few fighters and a handful of AA had been withdrawn by the 28th.

Between 18 August and 2 September, GAF reconnaissance of Allied ports was thorough; in the week before BAYTOWN an average of fourteen planes a day were over Allied territory. The enemy's bomber effort was directed largely against ports but it was weak and only partially effective. On the 17th and again on the 18th of August, at least sixty planes raided Bizerte. Most of the attackers were Ju-88's from the Foggia and Viterbo complexes; the remainder were He-111's, apparently from Salon in southern France. They inflicted some damage, sinking an LCI and damaging three other vessels; some oil installations were destroyed, and 22 military personnel were killed and 215 wounded. The Germans lost fourteen planes, four to Allied aircraft and ten to AA fire. One heavy attack by Ju-87's and 88's and a number of small raids by Me-109 fighter-bombers were made on shipping and shipping facilities at Augusta but damage was negligible, and a forty-plane raid on the 27th against Algiers accomplished nothing. The only night raid of the period, against Palermo, sank two submarine chasers, damaged a coaster, and caused heavy casualties.<sup>46</sup> The enemy's operations against Allied convoys were limited to a few small raids, mostly by fighter-bombers, which did little damage. To have had any hope of success, the GAF's attacks on the harbors where the invasion forces were being assembled would have had to be delivered in great strength. Such strength the Luftwaffe did not have.

By September the Axis air arm was no longer the powerful and aggressive force, either offensively or defensively, it had been in the previous winter. Allied bombing had pushed most of the enemy bombers from southern to central and northern Italy. Never committed to the American system of concentrating attacks until the objective had been saturated, the Axis commanders now were unwilling to risk the heavy losses which might result from large-scale missions. They had lost too many planes and first-line pilots to highly effective fighter and

AA defenses of the Allies and could expect no appreciable reinforcements from the eastern or western fronts. So severe were the demands imposed by activities of the Red Air Force and by the Combined Bomber Offensive, indeed, that the GAF was forced to withdraw aircraft from the Mediterranean—an act which helps to explain the decline of GAF strength there toward the end of August from about 1,100 to less than 600 serviceable planes.<sup>47</sup> Kesselring later said that before and after the Allied invasion of Italy the Mediterranean front was considered and supplied as the first front “in certain respects, such as the allotment of air forces.” But the fact remained that the Luftwaffe was fighting a “poor man’s war.”<sup>48</sup> With their air potential reduced to 50 to 100 sorties per day,<sup>49</sup> the best that the Germans in Italy could do was to conserve their strength in planes and crews, giving battle only in defense of the most vital spots or when the occasion seemed highly propitious and hoping thereby to be at the maximum possible strength when the time came to defend against the Allied landings on the mainland, which were so evidently to be expected.

In spite of its weakness, the Axis air arm on the eve of BAYTOWN was a factor which the Allies could not ignore. It had 1,500 operational aircraft of all types (exclusive of training planes and nonoperational reserves) in Italy, Sardinia, Corsica, and southern France; of these, roughly 900 were Italian and 600 were German. More than one-half of the German planes and almost a third of the Italian were in Italy south of 42°; the total was 670 planes, of which 380 were single-engine fighters.<sup>50</sup> However, to have a true picture of the enemy’s air strength it is necessary to remember that the Italian Air Force was a poor outfit at best. A large number of its planes were obsolescent, if not actually obsolete. Its best pilots had been eliminated in the desert campaign and after, and its present flyers were neither of high quality nor well trained and, in many instances, were far from enthusiastic. The Germans could count on no more than a minimum of help from the IAF.<sup>51</sup> And the GAF alone, with at least one-third of its 600 planes of low serviceability,<sup>52</sup> did not appear capable of offering serious challenge to the superior number and quality of NAAF’s planes and crews.

On the evening of 2 September, then, the Allied forces in the Mediterranean were ready to launch the first invasion of the Italian mainland. The days of planning were over. The preliminary tasks of softening up the Axis defenses, neutralizing its air arm, crippling its lines of communication, and isolating the battle area were done. In the eastern

Sicilian harbors of Augusta, Catania, Taormina, and Teresa some 300 BAYTOWN landing craft were ready, laden with troops, equipment, and supplies of the Eighth Army. In the Strait of Messina naval vessels turned more than 125 guns toward the Italian shore; and opposite Reggio 410 field guns and 120 medium guns were massed to give covering fire. Spitfires of Desert Air Force, tanks filled and guns loaded, stood ready to take off to cover the landing craft, the assault troops, and the beaches.<sup>53</sup> The first Allied invasion of Hitler's Europe was about to begin—it would be a fitting anniversary of the beginning of the war, exactly four years before.

### BAYTOWN

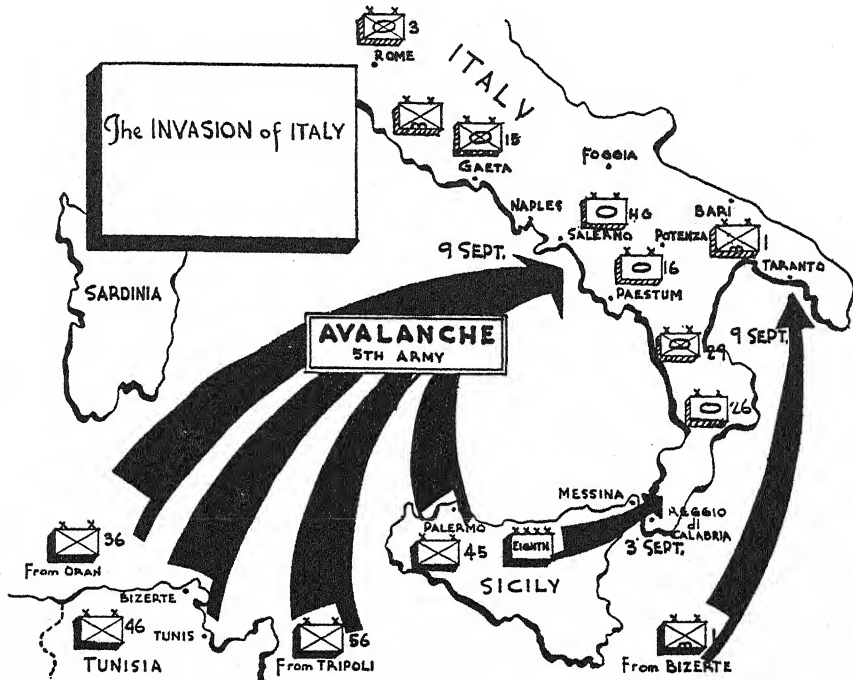
In the early hours of 3 September, under cover of naval bombardment from the strait and heavy artillery fire from the Sicilian coast, a Canadian infantry division went ashore at Reggio and a British division at Gallico and Catona. Enemy opposition was limited to token resistance by a few Italian coastal troops. No mines or demolitions were encountered. The beachheads were easily and speedily secured.<sup>54</sup>

Fighters and fighter-bombers of DAF covered the crossing and the landings, flying 253 sorties. They encountered only a few enemy fighters and saw no long-range bombers whatever. The negligible enemy effort permitted DAF's planes to take the offensive, and by noon light bombers and fighter-bombers were sweeping over the lower part of Calabria bombing and strafing gun positions, convoys, rail and road crossings, bridges, and troop concentrations. American A-20's and A-36's aided the British in these operations. When German fighter reinforcements appeared at the Camigliatello airdrome (east of Cosenza), sixty-nine B-25's of the 12th and 340th Bombardment Groups bombed the field, while Baltimores attacked Crotone airfield. That night, Beaufighters were up on defense and RAF heavy bombers flew sixteen effective sorties against Grottaglie airfield. For the day, DAF recorded 273 Spitfire and 230 P-40 sorties.<sup>55</sup>

Before midnight of D-day the Eighth had passed the high ground back of the beaches and had captured Reggio airdrome and the town of Gallico.<sup>56</sup> On the 4th and 5th the troops made steady progress, being held up only by demolitions. By the end of the 5th they had reached a line Bagnara-Bagaladi-Bova Marina and had a bag of 2,500 prisoners. The advance was feebly opposed; fighter reconnaissance flights re-

## INVASION OF ITALY

vealed that in the area there was no enemy force large enough to offer a genuine battle. It was evident that the enemy's plan was to organize his forces in depth and, by the use of demolitions and rear-guard actions, to slow the Allied advance as much as possible, meanwhile conserving the bulk of his strength to throw against an Allied invasion in the Naples area, which—although the Allies were not aware of the fact—the Germans had anticipated.<sup>57</sup>



On the 4th and 5th the Allied air forces, in spite of very limited enemy air activity and few good targets, were busy. They maintained cover over shipping in the strait. The enemy's single effort against the beaches was broken up and seven of his planes were shot down. Light bombers raided a defended position near San Stefano, in coordination with a successful ground attack. U.S. P-40's flew armed reconnaissance, while A-36's hindered enemy movements by bombing a road junction at Catanzaro with good results and attacked the road net and railway station at Cosenza. B-25's effectively bombed the roads and rail lines at Briatico, and U.S. A-20's and SAAF Baltimores attacked troop concentrations near Laureana and Gioiosa, respectively. These American

operations were in addition to the larger British air effort. During the two days, NAAF's planes over Calabria saw only a handful of Axis fighters, and reconnaissance showed that the airfields which might have posed a threat had been evacuated. By the end of the 5th, Tactical's effort had dwindled appreciably, for want of good targets and good weather.<sup>58</sup>

During the 6th and 7th the Eighth increased its pace, passing Palmi and Gioia in the west coast. Offensive air operations on the 6th were limited to a few fighter-bomber sorties, but on the 7th, Tactical's planes were busy enough to increase to more than 1,000 the total sorties by fighters, fighter-bombers, and light bombers for the first five days of BAYTOWN.<sup>59</sup> The day's largest operations, however, were conducted by mediums of Strategic and Tactical which went for lines of communication. The Crotona yards were attacked by thirty-six B-25's, the Trebisacce area by thirty-six, and the Lauria road net by thirty-two. In the heaviest attack, 106 B-26's dropped 158 tons on road and rail bridges at Sapri. During the night fifteen B-24's of the Ninth bombed the landing grounds at Manduria and San Pancrazio.

On the 8th the ground troops continued to move rapidly north. The advance was accelerated when a British brigade was landed in the early morning just north of Pizzo (Operation HOOKER). The landing met slight immediate ground opposition; a small air reaction was checked by the standing Spitfire beach patrol. Later in the morning, as ground operations developed, Tactical was requested to hit gun and heavy mortar positions which were shelling the new bridgehead; two squadrons of Kittyhawks dealt roughly and effectively with these centers of resistance.

As the day advanced, reconnaissance found signs that the enemy was evacuating the Catanzaro area, and U.S. P-40's and RAF Kittyhawks bombed and strafed retreating vehicles until nightfall. Mediums delivered several sharp attacks on lines of communication in Calabria and between there and the Heel, returning to bomb the Sapri road and rail bridges, the Lauria road net, and the Trebisacce bridges with notable success. These attacks were designed to interfere with the withdrawal of enemy troops and to prevent reinforcements from moving in. Indirectly, they supported AVALANCHE by striking at a transportation bottleneck on the west coast between Calabria and the Salerno area through which enemy troops moving north would have to pass.<sup>60</sup>





By night of 8 September the Eighth Army was approaching Catanzaro, where the widening of the Calabrian peninsula would allow freer movement. The Eighth was ahead of schedule; in the absence of genuine opposition by German ground and air forces, it appeared that the British would continue to move north at good speed, contacting the right flank of the Fifth Army—then en route to the Salerno beaches—at an earlier date than had been hoped for.

Since D-day heavy and medium bombers of NAAF had continued to strike at enemy airfields, lines of communication, and other military objectives. Most of the effort was directed against airdromes and landing grounds. These operations supported BAYTOWN but were intended primarily as a prelude to AVALANCHE. Plans for that operation had called for intensified day and night bombing from D minus 7 to D minus 1 of all fields within range of the Salerno assault area to deny their use to the Axis.

In spite of bad weather, the bombers carried out their assignments with a high degree of success.<sup>61</sup> From the 3d through the 6th, B-17's, B-25's, B-26's, and Wellingtons concentrated on airfields in the Naples area. Three heavy attacks smashed Grazzanise; two attacks battered Capua and Capodichino. The fields were cratered and hangars and other installations heavily damaged. Viterbo airdrome, north of Rome, took a severe beating from 180 tons dropped by 133 Fortresses; 13 aircraft on the ground were destroyed or damaged and the field was rendered unserviceable.

These attacks left only small, barely usable strips available to the enemy at Grazzanise and Capodichino on the eve of AVALANCHE, while the field at Capua was completely useless. The only important field in the Salerno sector, Montecorvino, was not attacked, for the Allies wished it left unscathed for early use after the landings.

On the 7th, NASAF directed its entire day effort (save for the BAYTOWN attacks below Salerno, previously mentioned) against the fighter and Ju-88 bases in the Foggia complex. One hundred and twenty-four B-17's in three attacks dropped more than 180 tons of explosives. Damage was considerable but not severe enough to hamper decisively enemy bomber operations. That night forty-eight Wellingtons attacked the Viterbo airdrome. The final pre-AVALANCHE assault on the GAF came on the 8th when forty-one B-24's of the Ninth Air Force bombed Foggia No. 2.

During the period 3-8 September, Strategic's planes attacked a

number of targets other than counter-air. B-25's bombed the railroad bridge, tracks, and roads at Minturno and the yards at Metaponto; Wellingtons attacked the Villa Literno and Battipaglia yards; B-17's made small attacks on the Minturno and Villa Literno yards;<sup>62</sup> and B-24's of the Ninth not only damaged the Sulmona yards but shot down 27 enemy planes. On the 8th, 130 B-17's struck a smashing blow against the town of Frascati, fifteen miles southeast of Rome, where the headquarters of the German high command was located. In the raid the heavies dropped 64 x 2,000-pound, 64 x 1,000-pound, and 1,172 x 500-pound bombs. The 389 tons destroyed many buildings and did extensive damage throughout the town; it was reported by the Axis radio that Field Marshal Kesselring himself narrowly escaped death.

On the night of 8/9, as the Fifth Army convoys neared the beaches, USAAF and RAF mediums carried out a series of attacks against three groups of objectives. Forty-nine B-25's bombed bases and roads which handled supplies and reinforcements in the interior, in and around Auletta, Avellino, and Potenza. Fifteen Wellingtons hit Formia and Gaeta, both on the Gulf of Gaeta where an Allied invasion was a possibility, and Forio on Ischia Island. These targets were shipping bases, but were selected primarily as a "cover" to the real landings. The third group of targets consisted of the two principal centers of enemy transportation in the AVALANCHE area, Battipaglia and Eboli. The yards at the former were attacked by thirty-seven Wellingtons with eighty-six tons of bombs; the railway junction at the latter by forty-two Wellingtons, also with eighty-six tons. Damage to rail lines, roads, and rolling stock was severe.

RAF and SAAF light bombers also were active between the nights of 4/5 and 8/9 September, flying 116 effective sorties against yards at Altamura, Battipaglia, Benevento, and Metaponto and against rail and road junctions and transport vehicles at Auletta, Avellino, Battipaglia, Benevento, Capua, Metaponto, and Potenza. These missions helped AVALANCHE, the Eighth Army, and a projected British landing at Taranto (Operation GIBBON).<sup>63</sup>

By 27 August photo reconnaissance had provided the welcome intelligence that tentatively planned attacks on Sardinia airfields—in protection of Salerno-bound convoys—would not be required. The enemy had begun to evacuate Sardinia; the landing grounds at Elmas, Capoterra, and Monserrato, all in the southern half of the island, had been rendered unserviceable, and the principal fighter bases in the north,

Alghero/Fertilia and Ozieri/Chivilani, were being used mainly to protect shipping in that area. The hard pounding which Allied planes had given to the island's ports and airfields prior to 1 September had paid dividends. NAAF found it necessary to bomb only Pabillonis airfield (north of Villacidro) which was attacked on the 5th, 7th, and 8th by a total of 112 P-40's of the 325th Group. The fighter-bombers dropped 20-pound frags and strafed aircraft and targets of opportunity.

The enemy's defensive air effort against NAAF's strategic operations during the first week of September was even smaller than before. Allied heavies and mediums flew about fifty missions; in half the cases they saw no enemy fighters, and in only sixteen missions were they attacked. In three instances only was the interception strong and aggressive—in the two Foggia raids on 7 and 8 September and the Frascati attack on the 8th. Each was jumped by forty to fifty enemy fighters. Offensively, the Axis carried out just one major attack, against Bizerte and Ferryville harbors on the night of the 6th. Around forty-five Ju-88's and He-111's participated; although the enemy used metal strips to jam Allied radar, he managed only to fire a petrol dump while losing five planes to Allied night fighters and four to flak.<sup>64</sup>

It was evident that the enemy was still conserving his air strength which, although badly depleted, was still capable of rendering valuable service in the days ahead. But in the hoarding process he suffered heavily. In the last week before the Salerno landings, Allied claims indicated that his air arm lost around 180 planes, destroyed, probably destroyed, and damaged (the Allies lost 70), while his poorly protected airfields, lines of communication, and installations were battered by almost 4,000 tons of bombs.

The heavy tonnage dropped by Allied planes during the week marked only the final effort; since 1 April, NAAF's planes had dropped close to 19,000 tons of bombs on the mainland of Italy, more than half since the end of the Sicilian campaign, and the Axis had lost on the ground and in the air more than 800 planes. Even on the sea the enemy could not hold his own, although the volume of Allied shipping was many times as great and operated in the open sea, whereas the enemy moved mostly along the coast. Between the middle of August and 9 September, NAAF's planes had sunk four enemy ships and had listed four as probably sunk and twenty-seven as damaged, while the Allies lost only six ships to enemy aircraft and submarines, although its vessels traveled 843,000 miles.<sup>65</sup>

On the evening of 8 September, then, the situation was this: BAYTOWN had got off to a good start and the Eighth Army was moving steadily northward; NAAF's planes, while covering the BAYTOWN operation, had smashed or pinned down the greater part of the Axis air forces which were within reach of Salerno and had seriously disrupted the lines of communication leading into the invasion area; and the AVALANCHE convoys, under the protection of Coastal Air Force, were approaching the beaches between Salerno and Paestum. Then, with dramatic suddenness, events in Italy forced the Allies to change some of their plans.

The changes stemmed back to the middle of the summer when Mussolini's Fascist government had been overthrown. Soon thereafter, the government of Marshal Pietro Badoglio originated plans designed to withdraw Italy from the war, and in August Allied and Italian representatives started secret negotiations for an armistice and an Italian surrender. General Eisenhower was empowered by the CCS to handle the negotiations and to decide the day and hour on which the end of hostilities would be announced and in effect.

Progress of the negotiations after 20 August convinced Eisenhower that in all probability an armistice would be signed before 9 September, D-day for AVALANCHE. Anxious to take quick advantage of Italy's surrender, he decided to launch a bold stroke designed to seize the Rome area. Italian acceptance of an armistice might be contingent upon Allied aid in Rome against German reprisals; at the cost of one diverted division he might secure Italian help in retarding the movement of German reinforcements and thus insure the success of AVALANCHE.

On 3 September a short-term armistice was signed at Cassibile, near Syracuse, Sicily, by Maj. Gen. W. B. Smith for General Eisenhower and by Brig. Gen. Giuseppe Castellano for Marshal Badoglio. Troop Carrier Command was immediately notified that the 82d Airborne Division, originally scheduled to be dropped in the Capua area (Mission "Avalanche"), in direct support of AVALANCHE, would not be so employed but instead would be dropped in the Rome area on the nights of D minus 1 and D-day (GIANT II). The Italians, whose armistice commission had agreed to ready airfields at Guidonia, Littorio, Cerveteri, Centocelle, and Furbara (all in the Rome complex) to receive the troop carrier planes and the paratroopers, would undertake to prepare the fields and protect them against the Germans and would provide

transportation, supplies, extra fuel, etc. The 82d would assist the Italians in preventing a German occupation of Rome.

At 0200 hours on 7 September, Brig. Gen. Maxwell D. Taylor of the 82d and Col. William T. Gardiner of Troop Carrier left Palermo for Rome to complete arrangements for GIANT II. There the two officers speedily became convinced that the mission would end in disaster: the Germans had built up their strength in the Rome area and had stopped the flow of gasoline and munitions to the Italian troops; the Italian military leaders had overcommitted themselves and could neither render effective aid to the airborne troops nor guarantee the security of the airfields and, disorganized and vacillating, had adopted an attitude of "let the Allies save the Italian government and Rome." So informed on 8 September, Eisenhower canceled GIANT II. Unfortunately, it was then too late to reinstate Mission "Avalanche."<sup>66</sup>

Thus, on the eve of the AVALANCHE landings the original plans were in effect with one important exception: there would be no drop of airborne troops in the vicinity of Capua to hamper the southward movement of German reinforcements for Salerno.

### AVALANCHE

The more than 600 men-of-war, transports, and landing craft allotted to AVALANCHE sailed in sixteen convoys which left the terminal ports of Oran, Algiers, Bizerte, Tripoli, Palermo, and Termini at varying times between D minus 6 and D minus 1. The several elements came together north of Palermo on D minus 1. By dusk of that day they were in position some fifty miles west of the beaches, had deployed, and had started their approaches.

Up to 2300 hours of D minus 2 the convoys were not bothered by enemy aircraft, although they were shadowed by reconnaissance planes. That night and on the following afternoon the Luftwaffe attacked five times in small raids which sank a British LCT and damaged an American LCI. Between 2000 and 2400 hours of D minus 1 the Northern Attack Force was repeatedly annoyed by small groups of torpedo bombers, and the southern forces fought off two heavy and five light attacks. A combination of good fighter cover, severe AA fire, and poor performances by the bombers kept damage to a minimum, one LST being hit and several ships suffering near misses. The enemy lost five planes to AA fire and five probables to CAF night fighters.<sup>67</sup>

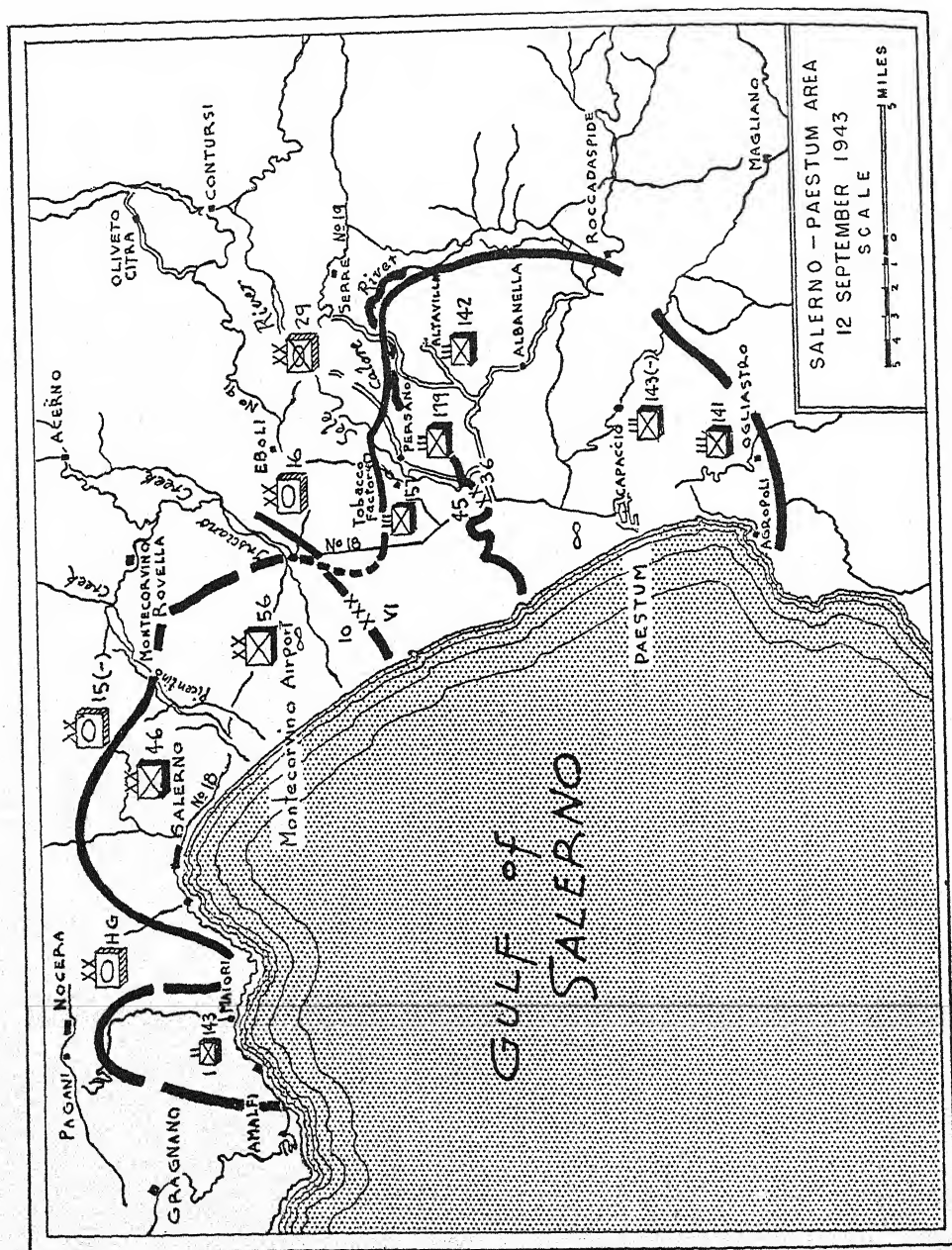
Between 2400 hours, when the ships began moving into their final

positions, and 0330 hours (H-hour), when the last of the assault troops headed for the beaches, there were no attacks by enemy planes. In fact, the entire area from Salerno to Paestum was quiet until the troops approached the beaches. The Germans, who had very accurately forecast Allied intentions, then greeted them in English over a public address system with the words "Come in and give up. We have you covered!" and immediately opened with artillery, mortars, and machine guns.<sup>68</sup> The fire struck all the way from the beaches to the transport lowering points. But in spite of some damage and confusion, the troops hit the beaches, spilled ashore, and began working inland.

By daylight VI Corps, on the right (south), was approaching its initial objectives. In the center the British 10 Corps also was moving inland but against bitter resistance. Between Salerno and Maiori, British Commandos had knocked out minor opposition at Vietri. On the left flank, American Rangers had landed unopposed at Maiori and were hurrying toward the mountain passes between Salerno and Pompei. At the end of the day the ground troops had made limited but steady progress inland. VI Corps had met tough opposition from at least four groups of tanks, but by nightfall the 36th Division had reached its objectives, being inland from four to six miles except in the extreme south around Agropoli. The 10 Corps had encountered even stiffer resistance but with the help of naval fire had advanced an average of 3,000 yards and was attacking Montecorvino airfield. Some of 10th's patrols had entered Battipaglia but had been forced out; others were approaching Salerno from the east. The Rangers were in the important Nocera and Pagani passes, and the Commandos were moving rapidly toward Salerno.<sup>69</sup>

During the entire day XII Air Support Command provided continuous air cover over the beaches and over shipping in the assault area. Protection was furnished by two squadrons of P-38's, one of A-36's, and one of Spitfires, supplemented by one squadron of carrier-based Seafires from as early as possible to 0800 hours and from 1800 hours to as late as possible; in addition, Seafires maintained standing patrols over the northern flank of the assault areas. In general, the Fleet Air Arm patrolled the northern end of the Gulf of Salerno as far west as Capri, while the USAAF and RAF covered the center and southern sectors. Throughout the daylight hours, 12 A-36's flying low cover, 24 P-38's medium cover, and 12 Spitfires top cover maintained a protective canopy. The A-36's and P-38's operated from bases on the Catania plain and





the Spitfires from fields in the Messina area.<sup>70</sup> By the end of D-day XII ASC's fighters had flown almost 700 sorties and the Seafires more than 250. After dark, Beaufighters from Sicily took over, keeping two planes over the beaches at all times. Operations for the day were limited to protecting the beaches and offshore shipping, and no direct support was given to the ground troops.<sup>71</sup>

The day fighters received very little assistance from the control center on the *Ancon* (largely because the near-by hills caused echoes);<sup>72</sup> the night fighters found the seaborne GCI accurate and helpful. But in spite of late warnings and scattered enemy attacks, Allied fighters shot down four enemy planes and damaged one, to the loss of two P-38's in combat.<sup>73</sup>

Opinions vary widely as to the amount, severity, and success of the enemy air reaction on D-day. The Western Naval Task Force recorded in its history of AVALANCHE that the enemy's "regular and persistent bombing and strafing attacks effectively interrupted unloading activities," and even declared that "the scale of these attacks has never before and has never since been equalled" in the Mediterranean theater.<sup>74</sup> On the other hand, a study of AVALANCHE prepared later by Mediterranean Allied Tactical Air Force stated that "very little enemy action in the air was encountered on the first day"; all of NAAF's summaries and reports for the day agreed that the Luftwaffe's effort was slim and that the raids were effectively dealt with; the British Admiralty's report on AVALANCHE notes that "little damage was done" by the attacks; and in a meeting held at the Admiralty on 20 October 1943 it was stated that the GAF's air effort over the beaches "was not severe, being confined to small tip and run raids." Captured enemy documents list only eighty-two GAF fighter and twenty-six ground attack sorties for the day.<sup>75</sup>

What actually happened was that the enemy flew enough small missions, and flew them regularly enough, to keep the Allied forces constantly on the alert and to annoy troops unloading supplies; but the sum total of his sorties was small, his attacks were not very aggressive and were distinctly of the "hit-and-run" variety, and the damage and casualties which he caused were slight, especially if they are considered in relation to the size and importance of the landings. The best proof of the effectiveness of the Allies' fighter cover is the fact that only one ship (an AT) was sunk and one (an LST) damaged. Nor is there any

evidence to show that damage to personnel and equipment on shore was anything except small.<sup>76</sup>

The activities of Strategic on D-day were designed primarily to continue the isolation of the battlefield by cutting roads, rail lines, and bridges. Three key places along the two main German reinforcement routes were hit. Sixty-one B-17's of the 97th and 99th Bombardment Groups dropped 172 tons on the bridges over the Volturno River at Capua; photographic coverage showed that both road bridges were almost completely destroyed, the railway bridge severely damaged, and several roads cut. The raid was of particular interest and importance as it was in the nature of a "replacement" for the paratrooper operation which had been canceled in order to set up the abortive GIANT II mission to Rome. Sixty Fortresses further hampered communications above Naples by attacking the Cancellio bridges between Capua and the coast; the 180 tons damaged the approaches to the bridges but did not hit the structures. One hundred and thirteen B-25's unloaded 170 tons of explosives on the yards, roads, and bridges at Potenza, east of the bridgehead; they hit the yards and roads but missed the bridges.

Two attacks on enemy airfields were carried out. Forty-one B-24's of the Ninth bombed the Foggia complex, where they met the only opposition of the day from the GAF,<sup>77</sup> and sixty-seven B-26's attacked a newly discovered landing ground at Scanzano, southwest of Taranto. Results were good at both places and, in addition, the Luftwaffe lost at least thirteen planes.

NAAF's total activities for the period from 1800 hours on D minus 1 to nightfall of D-day came to almost 1,700 sorties. The air forces claimed fourteen enemy planes destroyed, three damaged, and four destroyed on the ground against losses of four destroyed and five missing. As General Eisenhower put it, Allied air power was "flatout in support of 5th Army positions."<sup>78</sup>

On 10 and 11 September the Fifth Army consolidated the positions which it had won on D-day and continued to move slowly forward. By the end of D plus 2, VI Corps' line curved from the coast below Agropoli to Persano on the Sele River, being inland to a depth of eleven miles around Altavilla and Roccadaspide. On 10 Corps' front, where the mountains were closer to the shore and the German opposition was tougher, progress had been slower and the deepest penetration was five miles. Montecorvino airfield had been overrun but was not

available for Allied planes, as it was under artillery fire from the near-by hills. Farther to the northwest, troops of 10 Corps continued to clean up Salerno, the Commandos were astride the coast road, and the Rangers had advanced ten miles west to Positano while holding their positions in the Nocera-Pagani and Mount di Chiunzi passes against counterattacks.<sup>79</sup>

Meanwhile, the Allies had landed thousands of men and guns and hundreds of tons of supplies and equipment over the beaches. With the enemy denied the roads on both flanks and with the weather continuing good, the Allies hoped that their rate of build-up would be sufficiently rapid to offset the flow of German reinforcements which were racing up from the south and rolling down from the north. In spite of the generally satisfactory situation at the end of the 11th the Allies were concerned over two matters: one, inasmuch as Montecorvino was still untenable, fighter cover must continue on the old long-range basis, with possibly some assistance from temporary fighter strips which were being hastily constructed inside the beachhead; the other, the Germans were massing along the Sele River and it was problematical whether the Fifth Army was in sufficient strength to hold a heavy counterattack.

On the 10th and 11th the reaction of the enemy's air arm was stronger than it had been on D-day. The raids over the assault area were still mostly small and of the "hit-and-run" variety, but they were more numerous than on the 9th and some missions were on a larger scale. The planes appeared to be coming from Viterbo, Frosinone, and the Foggia bases, with a few bombers apparently flying down from southern France. On each day more than 100 enemy planes attacked; most of them were fighter-bombers, but there were some high-level and dive bombers.

NATAF's fighters met these attacks with the same system of patrols which had been used on D-day. On the 10th, day fighters broke up or turned away more than forty raids. On the 11th the enemy made a special effort against the Allied men-of-war and succeeded in damaging HMS *Flores* and the USS *Philadelphia* and *Savannah*. The attack on the *Savannah*, which resulted in a hit by a radio-controlled bomb, came at a time when the fighter cover had been somewhat reduced, partly because some fighters and fighter-bombers were being used to delay and disorganize enemy movement toward the assault area (this appeared feasible in view of the unexpectedly small enemy air reaction)

and partly in an effort to hold down pilot fatigue. After the *Savannah* was hit, normal cover was restored.

For the two days, XII ASC's fighters flew around 1,250 sorties and the Seafires 400. They claimed 20 enemy aircraft destroyed and probably destroyed, while losing 7.<sup>80</sup>

According to a Marine Corps observer, the air cover over AVA-LANCHE had been "excellent" during the first three days of the invasion.<sup>81</sup> But the situation at the end of the 11th was not one to cause rejoicing at NAAF. Land-based fighter pilots were beginning to show signs of fatigue from frequent and long flights from Sicily in cramped cockpits, and accidents were increasing rapidly. The number of operational Seafires had been reduced, "for a sustained air effort could not be kept up from carriers alone for more than 48 to 72 hours," and landing accidents had become frequent.<sup>82</sup> The Germans were increasing their air effort. Until Montecorvino airfield could be utilized, little improvement could be expected.<sup>83</sup>

From D-day through D plus 2, convoys had brought in some 3,000 ground personnel and 530 vehicles of XII AFSC, XII ASC, and the RAF. This personnel had two principal jobs: to move air force supplies and equipment from beaches to dumps and from dumps to airfields and to repair Montecorvino and prepare temporary landing fields near the beaches for fighter planes. On the evening of D-day a detachment of the 817th Engineer Battalion (Aviation) went ashore and began building an air strip but had to abandon the site an hour later because it was under enemy fire. A second location was chosen and before morning an emergency runway had been laid out. During the night, heavy equipment came ashore and early on the morning of the 10th the men began building a field at Paestum. Drainage ditches were filled, trees cut to clear the approaches, a 3,800-foot runway scraped, and a taxiway and enough hardstandings constructed to take care of one fighter squadron. By 0600 hours on the 11th, Paestum was operational, and before the day was over four P-38's had used it for emergency landings.

On the morning of the 11th the 817th began work on a second field, naming it Sele. That night pressure from the German ground forces forced them to evacuate the site, but they returned next morning and early on the 13th the field was completed. The following day they started in on a third field, known as Capaccio, which was operational on the 16th. The fields at Paestum, Sele, and Capaccio all were back of VI Corps. Behind 10. Corps, British airdrome construction companies

had been at work on two fields: one, Tusciano, could be used on the 11th; the other, Asa, on the 13th.<sup>84</sup> But until these fields were operational, NAAF's planes could meet the enemy air threat only after the long flight from Sicily.<sup>85</sup>

On the 9th, Mediterranean Air Command had informed Strategic and Tactical that for the next few days their job would be to isolate the battle area and to destroy enemy personnel and equipment. Tactical was made responsible for the area south of a line Battipaglia-Potenza-Bari, inclusive, and Strategic for all points north of that line. Road communications used by the enemy to reinforce the battle sector were to constitute the principal objective.<sup>86</sup>

Pursuant to this directive, NAAF's bombers on the 10th and 11th continued to hit lines of communication and airfields. They operated on a twenty-four-hour schedule, with RAF Wellingtons, U.S. B-25's, and RAF and SAAF light bombers flying night missions as a complement to the larger day effort.<sup>87</sup> North of the prescribed line, Strategic hit the yards at Grosseto, the road junctions at Isernia and Mignano, roads at Boiano, roads and bridges in the Ariano-Irpino area, the Formia road junction, road nets at Cassino and Castelnuovo, traffic at Avellino, the yards, roads, and bridges at Benevento, and other targets.\* With a few exceptions, notably at Boiano, the bombing was accurate. Secondary operations were conducted against airfields, attacks being made on Frosinone, Grazzânise, and the Foggia complex. The raids on Frosinone left the field unserviceable, with 150 craters. South of the line, Tactical's medium and light bombers hit the road junctions at Auletta and Corleto and transport in the Cosenza, Sapri, and Avellino areas, and its A-36's and P-38's bombed and strafed motor transport on the main roads leading to the battle zone. Pilots of the fighter-bombers claimed the destruction of more than 100 motor transports.

Allied air superiority made it possible to equip with bombs some fighters on patrol over the bridgehead. The pilots received their ground targets while in flight, and after bombing their objectives would then carry out their normal defensive patrols. This type of operation was used largely over 10 Corps, whose channels back to XII ASC were slow and uncertain. The system often enabled the command to furnish air support within ten to thirty minutes after the ground troops had sent in the initial request. However, until after Allied planes were based on shore air-ground cooperation was not satisfactory: the land lines

\* See maps, pp. 505, 508.



were unreliable, maps were poor, changes in bomb lines came through slowly, and requests from ground troops took so long to reach Sicily that planes often did not arrive for as much as four hours.<sup>88</sup>

The Twelfth's 111th Tac/Recce Squadron of P-51's and the British 225 Squadron of Spitfires provided tactical reconnaissance essential to close support, artillery fire, and intruder missions in the battle zone. At first, tactical reconnaissance was carried out on a prearranged basis with a set number of missions, but after D plus 3 (12 September) the 111th operated with VI Corps and 225 with 10 Corps. Each squadron carried out up to six missions a day. On the 18th, for the first time in the European war, a fighter plane (P-51) adjusted artillery fire on enemy gun positions.<sup>89</sup>

During the 10th and 11th, NAAF's aircraft of all types flew more than 2,700 sorties, of which almost 1,600 were by day fighters. A decrease in fighter sorties and an increase in fighter-bomber sorties on the 11th showed that NATAF was shifting some of its fighters from defensive patrols to offensive missions. The Allies lost fifteen planes while destroying thirty of the enemy in the air and an undetermined number on the ground. Losses on both sides occurred almost entirely over the bridgehead, for the enemy made no attempt to intercept NAAF's heavies and mediums but employed his fighters and bombers exclusively for offensive missions over Allied ground forces and inshore shipping.<sup>90</sup>

Meanwhile, on the Eighth Army front, on 9, 10, and 11 September the British had continued to push steadily northward, slowed only by extensive demolitions and German rear-guard actions. They occupied Catanzaro, Nicastro, and Petilia, and reached Belvedere. DAF coordinated with the advance, its light bombers and fighter-bombers on the 9th destroying more than 90 vehicles, damaging 130, and inflicting severe casualties on personnel as the German columns hurried through the narrow bottleneck below Paola. On the 10th and 11th, DAF's tactical activities were curtailed while its fighters flew escort missions for bombers attacking lines of communication leading to the Salerno sector.<sup>91</sup>

Meanwhile, too, General Eisenhower had launched Operation GIBBON-SLAPSTICK, sending a part of the British 1 Airborne Division into Taranto on the 9th and following it on the 10th with ground troops of 5 Corps. The landings were made without interference from the enemy. From Taranto the British moved rapidly north and northwest, meeting no opposition for several days except around Gioia.<sup>92</sup>

The taking of Taranto was a valuable operation. It gave the Allies an excellent port through which could be moved a large part of the supplies required by the Eighth Army; it permitted a direct drive against Bari, the best port on the Adriatic below Venice, and against Foggia, the center of the largest and most useful complex of airfields in southern Italy; and it further dispersed German air and ground forces.

By 12 September, in spite of serious disruption of his lines of communication by Allied bombing and strafing, the enemy had been able to bring reinforcements into the perimeter of the Salerno bridgehead. Elements of two Panzer divisions had arrived from the south and elements of two others from beyond Naples. Too, despite the advances which had been made by the Fifth Army, the Germans still held a number of interior roads and important heights and so were able to concentrate against almost any desired spot. The weakest place in the Allied line was along the Sele River where, except for one armored reconnaissance brigade, there was a gap of five miles between VI and 10 Corps. On the 12th the Germans launched a heavy counterattack in this sector with the object of cutting the Fifth Army in half. Two days later they had driven a deep and dangerous salient into the Anglo-American lines along a two-mile front. At one point the enemy was within a thousand yards of the beach. Kesselring, who considered it of great importance to deny Italy to the Allies as "an aircraft operating area," was hitting hard.<sup>93</sup>

In order to stop the Germans a large part of VI Corps was shifted into 10 Corps' Sele River-Battipaglia sector, leaving only a few companies of beach engineers, some air service troops and fighter-group ground crews, and other noncombat personnel to hold the various passes through the hills which led to the southernmost part of the bridgehead.<sup>94</sup> An enemy attack on the right flank of the Allied line could easily penetrate to the coast, catching VI Corps in a pincer movement; any further advance down the Sele River would completely split VI and 10 Corps, which might then be destroyed singly. The situation was critical. And it took the combined efforts of the ground, air, and naval forces to save the day.

While 10 Corps held firm against enemy attacks on the 13th and 14th, VI Corps plugged the weakest positions in its lines sufficiently to throw back German thrusts which came late on the afternoon of the 13th and on the 14th.<sup>95</sup> On the 14th the USS *Philadelphia* fired nearly 1,300 rounds against tanks, machine-gun nests, and roads; on the 15th

the British battleship *Warspite*, up from Malta, and the *Philadelphia*, *Boise*, and *Mayo* hurled tons of projectiles against troops and positions. HMS *Valiant*, which arrived on the 15th, did not open fire, the crisis by then having passed.<sup>96</sup> The naval fire was controlled by cruiser and Royal Artillery planes, shore parties, and U.S. P-51's, with the latter displaying such skill and good judgment that the commanding officer of the *Philadelphia* reported that their spotting was "by far, the most successful method" so far tried.<sup>97</sup>

The air forces played a vital part in breaking up the German counteroffensive. Like the naval forces, NAAF did not begin to throw its full weight directly against the enemy's ground forces until the 14th when the position of the Fifth Army had become most critical. Air operations on the 12th and 13th were a continuation of the program followed on the 9th, 10th, and 11th—that is, cover for the beaches and shipping and attacks on lines of communication, transport, and airfields—except that its bombers began to unload closer and closer to the battle line.

On the 12th and 13th, NATAF's fighters flew 1,150 defensive sorties over the bridgehead, against about 250 enemy sorties. NATAF's daily effort was lighter than on each of the previous three days because many of its A-36's had been shifted to fighter-bomber operations against transportation when it had been found that the Spitfires could extend their beachhead patrols to thirty minutes\* and when some fighters had moved into the newly constructed fields within the bridgehead. General House, ashore on the 12th, directed their operations.

On the 12th, NASAF's bombers flew 56 heavy, 147 medium, and 12 light bomber effective sorties against roads, dropping around 400 tons of bombs. The principal targets were at Mignano, Benevento, Isernia, Formia, Ariano, Corleto, Castelnuovo, and Auletta. During the night, Wellingtons unloaded 224 tons on the Castelnuovo road net, B-25's attacked roads at Auletta, Potenza, and Corleto, and light bombers raided roads east of the battle area. The attacks on Castelnuovo were especially useful as they cut the junction of the main German escape routes from Calabria. On the 13th the heavies and mediums lowered their sights and went for the roads immediately beyond the semicircle of mountains which inclosed the Salerno plain. B-17's, B-25's, and

\* The ability of the Spitfires to fly much longer patrols than had been expected and the fact that their 90-gallon tanks seldom had to be used up, together with the weak offensive effort put up by the GAF, allows one to speculate that the Allies might have invaded Italy at Gaeta instead of at Salerno.

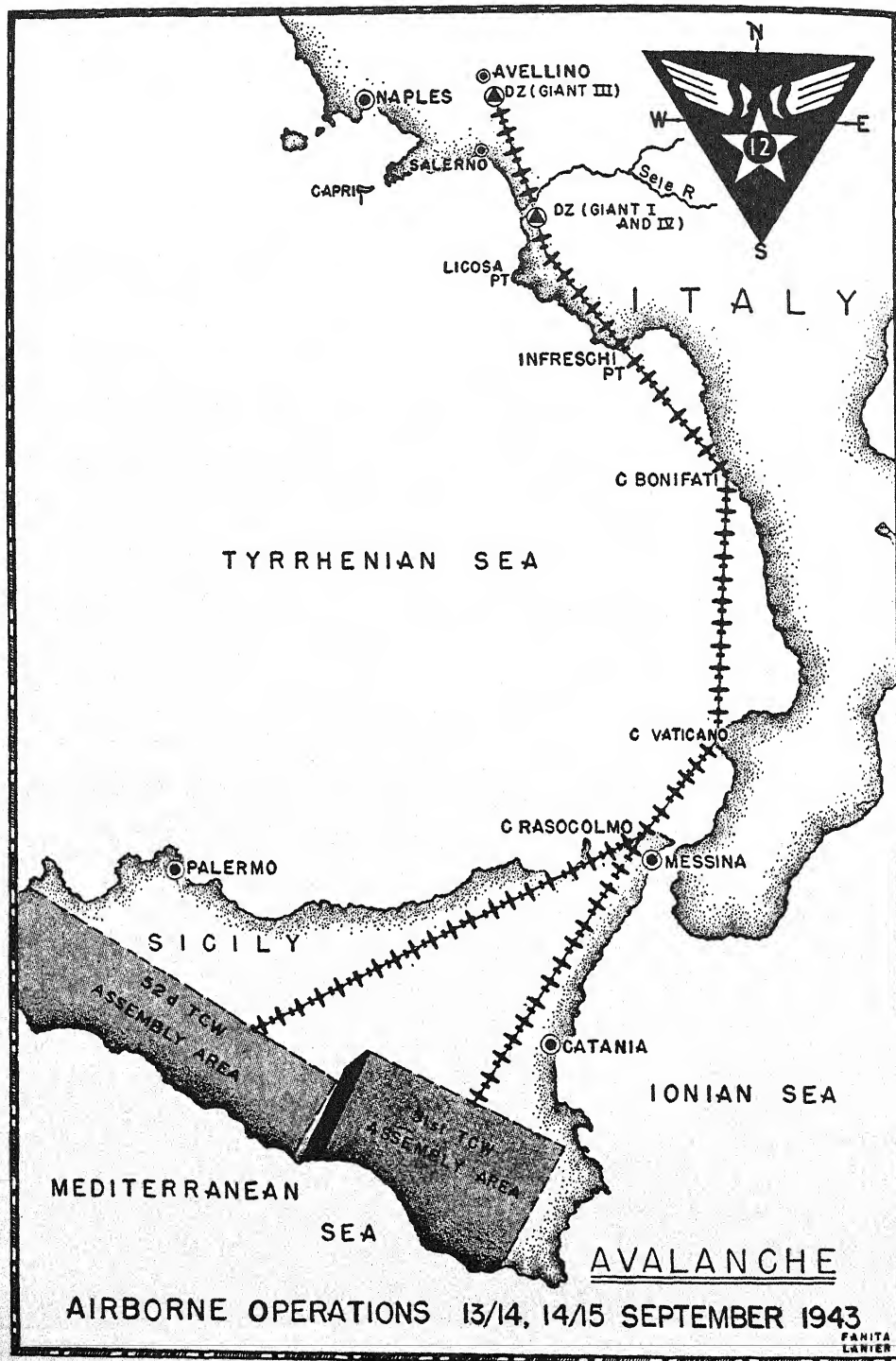
B-26's pounded Torre del Greco, Torre Annunziata, and Pompei—all on the roads from Naples to Salerno. On the main road to the south (from Salerno through Eboli and Auletta to Cosenza), B-17's and B-25's bombed the Sala Consilina highway and the road junction and bridge at Atena Lucana. During the night, Wellingtons went for the roads around Pompei, and B-25's attacked roads at Torre Annunziata; farther south, B-25's and Bostons bombed the roads and railway at San Severino. Light bombers carried out intruder missions over roads north of the battle zone.<sup>98</sup>

As the Allied ground situation further deteriorated on the 13th, NAAF threw its full strength against the enemy in close support of the Fifth Army. Its first task was to fly in troops to strengthen VI Corps. Three missions were set up: two of them involved drops immediately behind VI Corps, while the third was a drop near Avellino for the purpose of disrupting the movement of German troops southward.

The first mission,<sup>99</sup> coded GIANT I (Revised), was set up on a few hours' notice. The 51st and 52d Troop Carrier Wings were informed of the mission at 1330 hours on the 13th, orders for the mission to be carried out were issued at 1830 hours, and the first planes took off at 1930. Three Pathfinders led the way. They dropped fifty paratroopers, Rebecca-Eureka beacons, Krypton lamps,\* and handie-talkies squarely on the drop zone (DZ) 3.5 miles south of the Sele River. Within three minutes the Rebecca-Eurekas were in operation. Fifteen minutes later eighty-two C-47's and C-53's of the 61st, 313th, and 314th Troop Carrier Groups began coming in from Comiso and Trapani/Milo, Sicily, most of them homing on the Eurekas, to drop the paratroopers of the 504th Regiment of the U.S. 82d Airborne Division. The bulk of the troops landed within 200 yards of the DZ and all were within one mile except B Company of the 1st Battalion, which landed eight to ten miles southeast. Not a plane nor a man was lost and only one man was injured, although about 1,300 men were dropped. The paratroopers were taken by truck to a point near Albanella. After helping to stop the German advance, they went over to the offensive on the 17th and took Altavilla.

The following night (14/15), Troop Carrier flew GIANT IV, when 125 planes dropped 1,900 men of the 505th Regiment with their

\* A Krypton lamp is an instrument designed to produce a blinding white flash of one second's duration, visible in daylight from an altitude of 10,000 feet. The light cannot be flashed oftener than at five-second intervals.



equipment on the same DZ that had been used in GIANT I (Revised). The mission was highly successful, all except some forty men landing within a mile and a half of the DZ. Trucks took the men to Agropoli, Ogliastro, and Capaccio where they relieved the service troops and beach engineers who had been pressed into service for a possible last-ditch stand (and who by now were three days behind in their job of unloading over the beaches) and a part of the tired and battered 45th Division which had been in the line since the landings.

The third mission, known as GIANT III or AVALANCHE Drop, flown on the night of 14/15 to a point near Avellino, was less successful. The range of the radio transmitter and the Aldis lamps which the Pathfinder force set up was so limited that only a few of the aircraft received homing indications; high hills around the DZ probably further shortened the range, while the planes found it difficult to pick out the DZ area because of a similarity in topography among several valleys and ranges of hills in the vicinity. Nor was it possible to offset these difficulties by the use of visual ground signs, including a lighted "Tee," as had been done in the other drops. Because of the mountains around Avellino the drops had to be made from heights ranging from 3,000 to 5,000 feet (the drops near Paestum had been from 600 feet), which made pinpointing impossible. Of the forty planes of the 64th Troop Carrier participating, only fifteen dropped their men near the DZ. The remainder of the 600 troops landed from eight to twenty-five miles away. They came down in small scattered groups and in woodlands and vineyards, which made assembly difficult. Most of their equipment was lost. Only a small force, with limited equipment, reached Avellino where it blew a hole in the main highway bridge and then took to the hills, as did the other groups. After waiting several days for the arrival of the Fifth Army, the scattered elements moved south and bit by bit made contact with the Allies. On 8 October, 118 men out of the 600 who had been dropped were still listed as captured or missing.

The three missions had been carried out without fighter opposition and, save for a few strays, the planes had not suffered from German flak. There had been no fire from "friendly" guns as in the Sicilian drops. But in Washington, Marshall was far from satisfied with the results of the airborne operations in Sicily and Italy. He felt that the Allies were not using to the fullest the facilities at their disposal, and that the Sicilian and Italian campaigns "might have developed very differently if we had been in a position to handle simultaneously more



than one airborne division." He and Arnold agreed that the Germans were particularly afraid of airborne operations and that such missions would be of immense value in OVERLORD. As a result, the CCS instructed the Combined Staff Planners to reconsider the Anglo-American program and policies for the employment of airborne troops and their supply by air. In November it was decided to transfer most of the airborne troops from the Mediterranean to the United Kingdom for use in OVERLORD.<sup>100</sup>

On the 14th, as the ground situation entered its most critical stage, NAAF went all out in direct aid to the Fifth Army.<sup>101</sup> Bombers, fighter-bombers, and fighters flew more than 2,000 sorties. Of these, NATAF's fighters and fighter-bombers accounted for more than 1,000 sorties on patrols over the bridgehead and offshore shipping and in bombing and strafing attacks against targets of opportunity in the battle area. A-36's and P-38's attacked troops, vehicles, roads, bridges, and yards around Battipaglia, Eboli, Auletta, Torre Annunziata, and Avellino. Fighters of DAF, scarcely needed by the Eighth Army in its rapid advance, swept north from fields at Reggio to strafe transport near Eboli. In all, the fighter-bombers dropped 159 tons of bombs during the day.

Heavies and mediums—with most of the heavies flying two missions—divided their attention between roads leading into the Salerno area and German concentrations of troops and supplies in the Battipaglia-Eboli sector immediately behind the battle front. During the day of the 14th bombers of all types flew more than 1,200 sorties. That night, Wellingtons and B-25's continued the assault with heavy attacks on Battipaglia and Eboli and on roads around Auletta and Controne, while light bombers hit roads leading to the battle area. The Wellington mission of 126 planes was the largest force of night bombers dispatched in the theater to date. The attacks cut the rail lines from Torre Annunziata to Castellammare, Salerno, and Naples, and at Battipaglia those from Naples to Metaponto and Reggio; they blocked the highway to Naples and severely damaged the roads to Castellammare and Metaponto. The towns of Battipaglia and Eboli were all but obliterated.

On the 15th, NAAF's planes flew about 1,400 sorties, the effort being concentrated in the battle area. Out of 850 fighter and fighter-bomber sorties only 300 were on defensive patrol; the other 550 were against vehicles, troops, gun positions, and roads in the Eboli, Battipaglia, Auletta, and Avellino sectors. These bombing and strafing

missions destroyed more than 300 vehicles. Bombers flew 92 heavy, 250 medium, and 88 light bomber sorties during the day and 166 medium and 49 light bomber sorties on the night of 15/16. B-17's worked on the Battipaglia-Eboli road and roads at Torre del Greco; B-24's of the Ninth—planes which had been transferred on the 13th from the Ninth to the Twelfth—hit the yards and roads at Potenza;<sup>102</sup> B-25's attacked the Torre Annunziata road junction, troop concentrations at Roccadaspide, and roads back of the German lines; Wellingtons dropped 240 tons on roads at Pompei and Torre Annunziata; B-26's hit targets on the Battipaglia-Eboli, Serre-Eboli, and Auletta-Polla roads; and light bombers attacked troop concentrations at Eboli, east of Altavilla, and north of Roccadaspide and hit roads in the battle area. By the end of the day lines of communication at Potenza, Benevento, Castelnuovo, Capua, Formia, and Isernia were cut, blocked, or badly damaged.

In these operations on the 14th and 15th, Strategic Air Force was a tactical air force, for its heavies and mediums operated directly in cooperation with the ground forces. Some of its planes bombed so close to the Fifth Army that "a miss would have been disastrous."<sup>103</sup> There was little interference by the GAF. Only two of NAAF's bomber missions met enemy fighters. The German high command was using all the strength it could muster in offensive missions against the Fifth Army and its shipping, leaving German ground troops and transport completely exposed to NAAF's round-the-clock assault.

The results of the intense and concentrated bombing and strafing from the 12th through the 15th were profound. Strategic and Tactical had dropped more than 3,000 tons of bombs—the actual target areas had received an average bomb density of 760 tons per square mile. Whole towns were flattened, roads and railroads obliterated, and troop and motor transport concentrations severely damaged or wiped out. Enemy troops immediately in front of the Fifth Army were attacked, even by the heavies, although NAAF's bombing of the enemy in the salient might have been more effective had there been better training in mutual air-ground identification and the use of visual signals.<sup>104</sup> "Never before," said Headquarters, MAC, "have bombs been employed on a battlefield in such quantities or with such telling effect."<sup>105</sup> The Germans could not stand up under the combination of bombing, naval shelling, and ground fire. By the night of the 15th their dangerous attack had been blunted. According to enemy documents the Allied air and naval attacks had caused such heavy losses that the Germans had

no choice but to call off the attack. On the 16th they began pulling back and the Fifth Army prepared to go over to the offensive.<sup>106</sup>

The beachhead now was secure and the Americans and British were on the mainland to stay. But it had been a close call. The Allies had been nearer to a serious defeat than they would ever be during the remainder of the long Italian campaign, and at a time when a setback would have had the most unfortunate consequences. In the emergency the air forces had played their part well. Spaatz found in the battle further proof of the decisive effect in combined operations of air forces enjoying organizational and operational flexibility.<sup>107</sup> Ground force commanders (Alexander and Clark) were duly appreciative in their reports. Eisenhower was "convinced" that but for concentrated use of naval and air strength the ground troops might well have been pushed back into the sea; even at the most critical moment he had written Marshall that "our Air Force, the fighting value of our troops, and strenuous efforts by us all" would pull the Fifth Army through and that he expected to go over to the offensive as soon as his fighter-bombers and P-38's could base on the mainland.<sup>108</sup>

All-out commitment to direct cooperation with the ground forces left no planes for missions into northern and central Italy. General Eisenhower suggested to the CCS the value of a blow by bombers from the United Kingdom against lines of communication in northern Italy and requested the return to the Mediterranean of the three groups of B-24's which had operated there in July and early August. The CCS approved both suggestions, which were carried out promptly by the air forces in the United Kingdom. On the night of 16 September, 340 RAF heavies and 5 B-17's bombed the yards at Modane in southeastern France in an effort to close the northern end of the Mont Cenis Tunnel. At the same time, the Eighth dispatched 80 B-24's and 544 personnel of the 44th, 93d, and 389th Bombardment Groups (H) to the Mediterranean. These planes began operations on 21 September and continued to fly for NAAF through 1 October. Most of their missions were against lines of communication in north-central Italy.<sup>109</sup>

Eisenhower feared that his air force might not be able to continue its operations on the scale necessary to insure the success of Allied arms. The twin invasions had necessitated an actual employment of air forces far in excess of the planned employment. To reduce the scale of the present air effort might be disastrous; yet the air force was being depleted by attrition and would be further reduced by losses of crews

through completion of combat tours, which were especially rapid in the Mediterranean where excellent flying weather from March to November and the constant demands of land campaigns frequently permitted a crew to complete its fifty missions in from four to six months. A cable to Washington outlining these views brought no immediate reinforcements; other theaters were even shorter on replacements than was the Mediterranean, and with AVALANCHE and BAYTOWN secure it was anticipated that the pressure on NAAF's fighters would be reduced. Washington planned, however, to increase the minimum replacement rate from 15 per cent to 20 per cent (troop carrier crews from 7.5 per cent to 10 per cent), effective on 1 January 1944.<sup>110</sup>

While NAAF's planes had been helping to establish and then to save the Salerno bridgehead, they also had been busy with their several secondary tasks. Every night Wellingtons dropped hundreds of thousands of information and propaganda leaflets ("nickels") over central and northern Italy, Corsica, and Sardinia. Regularly, P-40's swept over southern Sardinia looking for signs of enemy air activity—and finding none. Daily, Photo Reconnaissance Wing sent its P-38's, Spitfires, and Mosquitoes over enemy territory and waters to photograph possible targets, locate concentrations and movements of troops, materiel, and aircraft, and assess damage. The enemy made strenuous efforts to interfere by sending up both planes and flak, but with no success. Because NAPRW's headquarters remained in North Africa during September there were delays of up to forty-eight hours in delivery of the important vertical photos to field units in Italy, but this unsatisfactory situation was partly alleviated by having a tac/recce squadron make a number of pinpoint photos. On one occasion such photos were requested by an infantry division, taken, developed, interpreted, and the target fired on by artillery in the space of six hours.

Coastal Air Force escorted aircraft carriers and convoys, attacked submarines, scrambled against hostile planes over Allied territory (its Beaughters so ably protected the beachhead and offshore shipping at night that the Luftwaffe soon virtually abandoned night attacks), conducted air-sea rescue searches, and reconnoitered over Sardinia, Corsica, and the approaches to all of the enemy's major ports from Marseille to Piombino. Coastal helped also to escort to Allied ports the dozens of Italian warships which had left their stations on the evening of the 8th when Marshal Badoglio had announced the surrender of Italy.<sup>111</sup>

Summaries of air activities on behalf of BAYTOWN and AVALANCHE were impressive. In the period from 1 through 15 September, NAAF's fighters and bombers flew approximately 17,500 sorties. Planes of the USAAF accounted for two-thirds of this number. Fighters (not including A-36's) flew about 11,000 sorties, and bombers around 6,500. Together they dropped almost 10,000 tons of bombs, three-quarters of which were unloaded by aircraft of USAAF. NAAF's aircraft claimed the destruction in air combat of 221 planes, while losing 89; planes of the USAAF were credited with 80 per cent of the victories and suffered 66 per cent of the losses.

During the four critical days from the 12th through the 15th, NAAF's planes flew more than 6,000 sorties and dropped over 3,500 tons of bombs. Three-fourths of all the sorties were flown by planes of the Twelfth Air Force. Of the total sorties, fighters flew around 2,700, mediums 1,100, fighter-bombers 800, heavies 550, light bombers 400, and night bombers 300. Planes of NAPRW flew almost 100 sorties, and aircraft of Coastal—which did not operate over the mainland—around 400.<sup>112</sup>

At the end of the first week of AVALANCHE, the BAYTOWN and GIBBON-SLAPSTICK operations still moved steadily forward. On the Calabrian front, Eighth Army reconnaissance units had reached Sapri, seventy-five road miles below Paestum, and advance patrols were still farther north; to the east, troops were beyond Spezzano. On the Apulian front the Allies controlled everything south of a line Mottola-Ginosa and all of the Heel except a small area around Brindisi; patrols had reached Bari. Only around Gioia were the Germans putting up any resistance.

Things also were going well across Naples Bay and the Tyrrhenian Sea. The Allies occupied the island of Ventotene on the night of 8/9 and Capri on 12/13, thus gaining control of the approaches to Naples as well as sites for radar facilities and motor boat stations. In Sardinia the Germans were pulling out rapidly after having destroyed their installations and airfields on the northern half of the island. On Corsica, patriots and Italian troops were harassing the Germans at all points, but the latter were in sufficient strength to hold those places on the island (notably Bastia) essential to a complete evacuation.<sup>113</sup>

With AVALANCHE secure the Allies were in position on the 16th to move northward across the peninsula. Between that date and the 19th the Fifth Army passed from the defensive to the offensive, took

over all of the Salerno area from the beaches to the mountains, and joined with the Eighth.<sup>114</sup>

On the 16th, as the ground troops, led by fighter-bombers, pushed toward the hills around the beachhead,<sup>115</sup> General Eisenhower cabled the CCS that the work of the air force continued to be "superb."<sup>116</sup> NAAF's activities for the day merited the words of praise, for its planes flew more than 1,200 sorties and dropped over 1,000 tons of bombs. Bombers, now released from emergency tactical and quasi-tactical operations, hammered the outer ring of communications from Capua to Potenza; fighters and fighter-bombers defended the battle zone and attacked troops and positions. The air assault simultaneously interfered with the enemy's withdrawal and the advance of reinforcements.

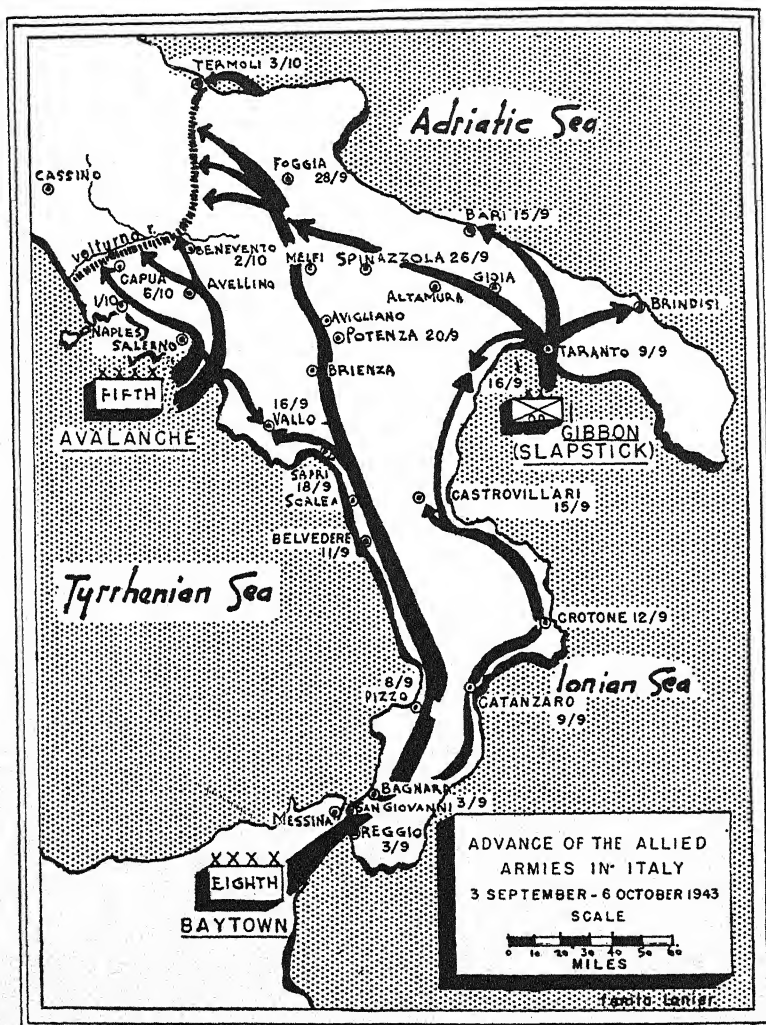
The enemy's air activity for the day came to around 120 sorties, all of them against shipping and the beachhead. His principal success was the damaging of HMS *Warspite* with two direct hits from glide-bombs. The enemy's airdromes, after five days of respite from bombs, were beginning to show signs of increased activity; accordingly, beginning on the night of 16/17 September, NAAF's heavies and mediums initiated a two-day counter-air offensive against the Foggia fields, the bases near Rome, and Viterbo. It was not necessary to attack the fields around Naples, still unserviceable, or any fields south of the line Naples-Bari, all of which were in Allied hands or too badly damaged to be used by the GAF.

The blitz against airdromes ran through the 18th. When it was over some 600 bombers had dropped over 700 tons of bombs and 91 P-38's had carried out a successful strafing attack; close to 300 GAF planes and gliders had been destroyed or damaged on the ground; and Cisterna/Littoria, the two Ciampinos, Pratica di Mare, Cerveteri, Viterbo, and the four most active of the Foggia fields were so badly battered as to be of little or no service to the enemy.<sup>117</sup> The GAF was forced to withdraw its bombers to fields in northern Italy and France and its fighters to the Viterbo and Lucca areas. This retreat reduced operations against the Fifth and Eighth Armies from an average of about 100 offensive sorties per day to around 30. This, in turn, permitted Tactical to return all P-38's to Strategic and to reduce its patrols to between 200 and 300 per day, which freed many fighters for escort duty and fighter-bomber missions. The operations of the fighter-bombers were furthered by the move of a large number of planes to bases on the mainland—by the 21st, three squadrons of the 86th Fighter-



## THE ARMY AIR FORCES IN WORLD WAR II

Bomber Group were flying from Paestum—and the establishment ashore of signal communications, including ground control interceptors, light warning sets, wireless units, and land lines.<sup>118</sup>



NAAF's preoccupation with airfields did not prevent its planes from hitting communications and concentrations all the way from the battle area to above Rome on the Tyrrhenian Sea and to Pescara on the Adriatic.<sup>119</sup> Air operations over the eastern battle zone were on a small scale, for the Eighth Army, meeting limited opposition, needed very little

air support. Spitfires of DAF patrolled the battle line but saw few enemy planes, the GAF's dwindling effort being almost entirely against the Fifth Army. These conditions lasted to the end of the month.<sup>120</sup>

With the enemy's air arm rendered impotent the Allies on the 20th again began to use air bombardment to interrupt the German retreat and to force concentrations of personnel and equipment for the attention of the light and fighter-bombers. For the remainder of the month, as the Allied armies moved steadily toward Naples and Foggia, with heaviest fighting falling to the lot of the Fifth, the air forces concentrated their effort against the withdrawing foe. In spite of restrictions imposed by intermittently bad weather and an increasing shortage of fighter-bomber targets as the Germans shifted the bulk of their transport operations from daytime to nighttime and from primary to secondary roads,<sup>121</sup> NAAF's planes achieved a high degree of success.

From the 20th to the 24th, Strategic's main effort was against road junctions, bridges, and other bottlenecks north and east of Naples. Formidable blocks were created at Formia, Caserta, Benevento, and Castelnuovo; road bridges were knocked down or blocked at Lagonegro, Avellino, and Capua; railway bridges were left impassable at Formia and Pescara, and other bridges in both areas were unusable. American mediums bore the brunt of this offensive, with some assistance from RAF Wellingtons. Strategic also flew a number of missions against objectives directly ahead of the advancing armies, while fighters of the 31st and 33d Groups and A-36's delivered small but consistent attacks by day and by night on battlefield targets and on troop and transport concentrations. These softened resistance and aided the Fifth Army as it pushed slowly across the mountains toward the Naples plain, although the constantly shifting ground situation, the rugged, wooded terrain, and the skeleton-type of rear-guard resistance employed by the Germans made it difficult for the bombers to locate good targets.<sup>122</sup>

From the 24th to the end of the month the air forces had more trouble with the weather than with enemy aircraft. Rain and wind interfered with activities at the home fields and, together with heavy clouds, obscured targets. Activities were lighter than during the preceding week and far below the peak of 11-17 September. Nevertheless, the air forces had a busy week. Heavies of the Twelfth, after a solid smash at Pisa's yards on the 24th, put in three long-distance blows on

the 25th with strikes against yards at Bologna, Bolzano, and Verona. On the return trip they found the newly acquired Sardinian airfields useful, a number of aircraft landing at bases around Decimomannu. Tactical's bombers also were busy on the 25th, B-26's bombing lines of communication north of the battle line while B-25's attacked fortified positions at Nocera and Serino and troop concentrations at Sarno so as to soften up the enemy for the Fifth Army's impending breakthrough into the Avellino sector.

On the 26th, 27th, and 28th weather pinned down all but a few bombers. On the 29th and 30th the Twelfth's heavies were still grounded, but its B-25's and B-26's flew 186 sorties against the Volturno bridges. Bombing accuracy was far below normal, damage to the bridges being negligible. During the two days B-25's flew 94 sorties against the road junction and bridges at Benevento, and its P-38 fighter-bombers dropped thirty tons on the Ausonia defile, near the Liri Valley.

When NAAF's Wellingtons failed to record a sortie on the 20th, it marked the first night during the month that they had failed to operate. Between 26 June and 29 September they had flown on 88 out of 92 nights, averaging 65 sorties with only 130 available and serviceable planes. This record was made possible in part because the Wellingtons always had two crews for each plane and because all losses were promptly replaced.<sup>123</sup>

The activities of fighters and fighter-bombers, like those of the heavies and mediums, were on a considerably reduced scale during the last week of September. Bad weather and almost no enemy air activity lowered the daily average of defensive fighter patrols to less than 100. Fighter-bombers, however, got in a number of good licks against troop concentrations, defended hills, gun positions, bivouac areas, transport, roads, bridges, and airdromes close to the moving battle line and in the areas around Benevento, Nocera, Sarno, and Camerelle north of the Fifth Army sector and Castelnuovo and Isernia beyond the Eighth Army front.<sup>124</sup>

By the 25th the greater part of the USAAF and RAF fighter units and a number of reconnaissance squadrons were operating from mainland airfields; this made possible the good work of the fighters and fighter-bombers in the face of poor weather and against targets constantly farther north. Beginning on the 14th, additional air service units took over the job of maintaining the three American-built fields and

servicing the combat units there. On the 20th, Montecorvino was at last free from enemy artillery fire and it quickly became the principal air-drome in the Salerno area. Serviced by the 306th Service Squadron of the 41st Service Group, Montecorvino by the 25th was supporting the 31st Fighter Group and three RAF squadrons and was being used by planes of Troop Carrier and Mediterranean Air Transport Service engaged in special missions into the area. Another key field was Paestum, home of the 33d Fighter Group, most of the 86th Fighter-Bomber Group, and, as early as the 16th, a terminal for airborne medical services and a take-off point for air evacuation of the wounded. Paestum served also as the unloading point for equipment and supplies—auxiliary fuel tanks, blankets, etc.—brought in by air transport. Not all of XII AFSC's units entered Italy by way of the Salerno beaches. Some had gone in behind the Eighth Army and followed it north, servicing planes, hauling bombs and gasoline and rations, operating control towers, maintaining fields and facilities, and doing dozens of other necessary jobs.<sup>125</sup>

During the last ten days of September, NAAF conducted a special operation against the enemy's Corsica-Leghorn sea and air evacuation route, used by Germans who had recently left Sardinia and those who now were being pushed out of Corsica by French troops and Corsican patriots.\*<sup>126</sup> On the 21st the B-24's which Eisenhower had borrowed from the Eighth Air Force carried out their first mission under the direction of NAAF, thirty-two attacking Leghorn and twenty attacking Bastia. The assault on the route was continued through the 25th, with Wellingtons, Mitchells, and Liberators hitting airfields at Pisa and Bastia and installations there and at Leghorn. B-25's struck successfully at ships between Corsica and Elba, and Coastal Beaufighters and Marauders raided transport aircraft, shooting down nineteen Ju-88's on the 24th. In spite of NAAF's efforts the Germans eventually succeeded in evacuating some 25,000 personnel and 600 tons of supplies. But to do so they had to use so many fighters along the route that their troops on the mainland had to fight with practically no air support.

\* Meanwhile, French Air Force Spitfires of Coastal, flying out of Ajaccio, Corsica, in their first real combat operations under NAAF, protected ground forces against enemy raiders over the island. Pilots of the French 2/7 and 1/3 Squadrons shot down nine enemy planes. Their most notable success occurred on the 24th when the Luftwaffe struck one of its two September blows against Allied ports; ten Do-217's and one Ju-88 attacked Ajaccio, and of this force the French pilots shot down five. During the raid the enemy used a new-type glide-bomb, previously known to the Allies only in a few antishipping strikes in the Gulf of Salerno.

With almost no interference from the German Air Force<sup>127</sup> the Eighth Army advanced past Potenza, Gioia, and Bari to occupy the abandoned airfields of Foggia on 27 September and by 1 October was in possession of the entire Gargano peninsula. The Fifth Army, after hard fighting in the hills and mountains above Salerno, debouched onto the Naples plain on 28 September and then captured Naples itself on 1 October.<sup>128</sup> With the capture of Naples and the Foggia airfields, the primary missions of AVALANCHE and BAYTOWN had been accomplished. Italy had been eliminated from the war, and the Allies now held in Naples, Bari, and Taranto three of that nation's best ports and two of its most important air centers (Naples and Foggia).

To assess accurately the contributions of the several arms in these successes would be impossible; but the air forces could well be proud of their work. Aerial bombardment and the fear of continuing attacks had been important factors in encouraging Italy to surrender. NAAF, having seriously crippled the German Air Force, had brought the invasion convoys through with nominal losses, then had protected the assault forces as they poured ashore and set up their beachheads. Under air cover more than 200,000 troops, 100,000 tons of supplies, and 30,000 vehicles had come in over the beaches, with only five Allied ships sunk and nine damaged by the enemy air forces.<sup>129</sup> Allied air had helped blunt the German counteroffensive, then had paced the Fifth and Eighth Armies as they moved north, interfering with German movements toward and away from the front and smashing strong points, troop concentrations, and gun positions. Air bombing and strafing had contributed importantly to German casualties and materiel losses.

The statistics covering sorties, bomb tonnage, and claims were impressive.<sup>\*130</sup> But statistics alone could not reveal the excellence of NATAF's close coordination with the ground armies. NATAF had profited from its experiences in Tunisia and Sicily. Early operations in North Africa had shown to be unsound the old principle of close support in which aircraft were parceled out to individual ground units instead of being used as an integrated and flexible force in support of the

\* NAAF's planes had flown more than 20,000 sorties, had dropped about 19,000 tons of bombs, and had registered combat claims of about 300 enemy planes destroyed, 50 probably destroyed, and 110 damaged; another 200 were destroyed on the ground. The claims appear to have been very conservative, for by 3 October, Allied ground troops had collected around 1,000 enemy planes. NAAF claimed, too, some 1,100 to 1,200 motor transport destroyed, 2 ships sunk, 2 severely damaged, and 19 damaged. AAF units contributed roughly two-thirds of the offensive effort and destroyed about an equal proportion of enemy planes. NAAF's losses included about 150 planes lost and 99 damaged.

## INVASION OF ITALY

army as a whole. In the Tunisian and Sicilian campaigns progress had been made toward a more effective employment of air units under the central control of the air commander with decisions on joint operations reached jointly at the army and air command level. Applied during AVALANCHE with greater perfection than before, the new practice proved workable and effective. In actual operations, air-ground coordination involved close liaison between army headquarters and XII ASC, use of forward controllers ("Rover Joes") operating with jeeps or other mobile equipment, and meetings between air and ground leaders to choose targets for the following day, the actual decision resting with the air commander. Frequently modified by local conditions, these practices remained fundamental throughout the war.<sup>131</sup>



## CHAPTER 16

\* \* \* \* \*

### THE FIFTEENTH AIR FORCE

THE surrender of Italy and the conquest of the southern part of the peninsula brought to the Allies a number of actual and potential benefits. The first wedge had been driven into Hitler's *Festung Europa*; a heavy blow had been struck at German prestige. The elimination of thirty Italian divisions in the Balkans cut heavily into German reserves by forcing the Wehrmacht to police that area. With the Italian fleet out of the war and the Mediterranean virtually an Anglo-American lake, the Allies could release heavy naval units for service elsewhere. The prospects for a successful cross-Channel invasion were enhanced: men, materiel, ships, and planes could be spared for use out of the United Kingdom, and a pincer movement against the German armies in France could be planned. In the face of these threats the Germans would have to disperse further their air and ground forces.

For the air forces there were various advantages. From airfields near the Adriatic coast, heavy bombers could hit important targets in the Balkans, Czechoslovakia, Austria, and southern and eastern Germany. Ploesti's oil, the Danube supply route, and Wiener Neustadt's industries were within range. Allied air power from Italy could co-operate with the armies of the U.S.S.R. as they moved into Rumania and Bulgaria. Air bases on Sardinia and Corsica would allow NAAF to attack every part of northern Italy and to threaten, with fighter-escorted mediums, the German-held littoral from Rome to Perpignan in France, and would assure air cover for any future amphibious operations between Rome and Marseille. NAAF's planes, flying from mainland and island airfields, could strongly aid the Allied ground armies as they continued their drive up the peninsula from the Volturno-Trigno line. It was the task of the air forces now to exploit those advantages.

*Tactical Operations, October*

During the month which followed the occupation of Naples on 1 October, NAAF's operations were on a smaller scale than they had been in September. For one thing, the weather was bad. The inclement days in October actually proved to be hardly more than a mild introduction to the miserable winter which lay ahead and which would give the lie to all that the American soldier had heard of sunny Italy, but there were enough bad days to interfere seriously with planned operations, both ground and air.<sup>1</sup>

There were other interferences. During September, NAAF's aircrews and planes had operated under a scale of effort so intense that now the demands of weary men and aircraft for a reduction in effort could not be ignored; too, there were fewer crews available, for many combat personnel had completed the required number of missions and had been withdrawn. Time was lost from operations while units moved to new bases on the mainland.<sup>2</sup>

Actually, the tactical situation was such that it was not necessary for the Allied air arm to continue to put forth its maximum effort. The battle lines were beginning to stabilize so that the need for tactical cooperation with the ground troops was less constant than it had been earlier, while the steady decline in the enemy's air effort reduced the demands on NAAF's offensive and defensive fighters. By the end of September the GAF was in no position to interfere seriously with Allied operations, whatever their character. Its bomber units had been forced back to bases in the Po Valley. Most of its fighters had been withdrawn only as far as the area between Rome and Pistoia, but units in need of refitting—and there were many—had been sent to northern Italy, entirely out of range of the battle zone. Noticeable deficits on the peninsula of airplane tires, engines, and fuel and airfield ground equipment bore testimony to the effectiveness of Allied bombing. The GAF was suffering from a shortage of crews, and many of the crews which it did have were of low quality.<sup>3</sup>

Under these conditions it was not surprising that the activities of the Luftwaffe during October were limited and spotty. Defensively, it offered only occasional opposition to NAAF's bombers until after the middle of the month; then, being better established at its new bases, it was able to attack about one-half of all Allied missions, although on a small scale and without aggressiveness. However, the enemy partly

offset his weak aerial defenses by an increased use of AA, so that NAAF's units reported heavier damage from flak than at any time in the past, one bombardment group, the 340th, having ten of twelve planes holed by AA fire on a mission against Venafrò.

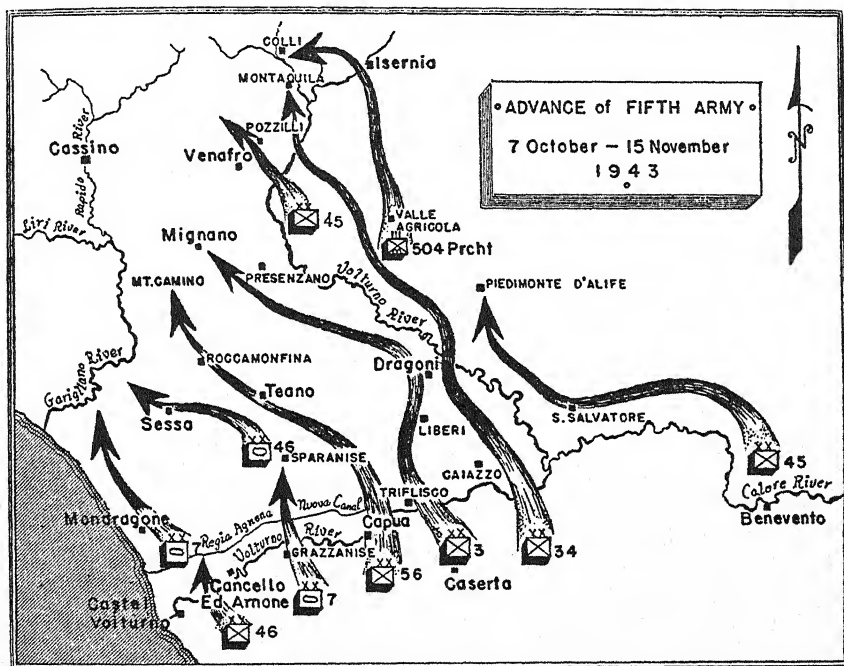
In offensive operations, the GAF's record was similarly poor. In the largest effort since the first week of AVALANCHE, its fighters and fighter-bombers on 15 and again on 16 October put in approximately seventy-five sorties against bridges and other Allied communications targets along the Volturno. But the effort quickly declined after NATAF shot down eleven of the enemy without loss to itself. Although in long-range attacks the GAF made a better showing, it accomplished little. For the first time since August its bombers staged a major raid on an Allied convoy—near Oran. This was followed by an attack on shipping near Cap Ténès, the bombers coming from the Istres-Montpellier complex in southern France. The two raids cost the Allies only one ship sunk, although three others were damaged by aerial torpedoes. On the night of 21 October the enemy staged his greatest offensive effort in more than two months (exclusive of his attacks in the Aegean) by laying on three separate attacks. Some twenty Ju-88's bombed the harbors at Naples and near-by Bagnoli; the only damage to installations was the destruction of a gun position, but some 50 military personnel were killed and 100 were wounded. Twenty-five Do-217's and He-111's attacked a convoy off Algiers, the raiders coming in at an unusually low altitude with torpedoes and radio-controlled bombs to damage two ships. Night fighters and AA knocked down six of the enemy. The third raid of the night was against bridges along the Volturno, but it was on a small scale and did little damage. The enemy's burst of activity ended on the 23d with a night raid on Naples; the twenty Ju-88's which attacked used strips of tinfoil (commonly known as Window or Chaff) in order to upset the Allies' radar control and succeeded in setting one vessel on fire.<sup>4</sup>

With the GAF reduced to such an innocuous state, NAAF was able to devote most of its attention during October to the needs of the Fifth and Eighth Armies as they continued to move up the peninsula. Following the capture of Naples the Fifth had quickly reached the Volturno River, and by the 15th had crossed to the north bank; a week later the Eighth was at the lower reaches of the Trigno above Termoli. By the end of the month the battle line ran roughly from Mondragone, on the Gulf of Gaeta, to above Teano, Piedimonte, and Boiano, and

## THE FIFTEENTH AIR FORCE

thence northeast along the Trigno. In the latter half of October the advance had been slow in the face of stubborn German resistance and against the obstacles imposed by mountainous terrain, rivers, poor roads, blown bridges, and unfavorable weather.

Both NATAF and NASAF had aided the Fifth Army in its drive to the Volturno, Tactical by close support and Strategic by continuing its program of creating road blocks along and above the Volturno.<sup>5</sup>



Mediums and fighter-bombers attacked enemy supply lines along the Volturno and at a secondary defense line which ran from Formia to Isernia. Three main highways ran through this second line and into the battle area: the coast road through Terracina and Formia, the center road through Arce and Mignano, and the inland road through Isernia.\* Strategic hit each of these towns and a bridge at Grazzanise and one near Capua. The attacks stopped all traffic on the coast road, slowed up traffic on the other two, and so jammed military transport that units of Tactical were able to claim the destruction of more than 400 vehicles. Going farther afield, B-17's and Wellingtons dropped 912 tons on the

\* See map, p. 553.

yards at Pisa, Bologna, Civitavecchia, and Mestre, rendering all of them inoperative. The attacks brought out such an unusually strong GAF fighter reaction that, on the night of 5 October, Wellingtons dropped eighty-two tons on Grosseto airdrome, destroying eleven aircraft.

Photo reconnaissance having revealed that the GAF had increased its fighter and bomber strength in Greece and on Crete and the Dodecanese Islands to around 350 planes, Grecian airfields during the first week of October became targets of high priority. The enemy's build-up posed a triple threat to the Allies: to the port of Bari and the airfields around Foggia; to Allied holdings in the Aegean (the British had recently occupied the islands of Cos, Leros, and Samos); and to Allied shipping in the narrow waters between Crete and the Cyrenaican bulge. Between 4 and 8 October the Twelfth Air Force went for the larger fields,<sup>6</sup> as B-24's, B-25's, and P-38's dropped thousands of frags and several hundred tons of GP bombs on Argos, Athens/Tatoi, Athens/Eleusis, Herakleion, Salonika, Araxos, and other fields in Greece, Crete, and Rhodes. A number of enemy planes were destroyed, and hangars, runways, and installations were well covered. Concurrently, two groups of B-24's, one of P-38's, and a squadron of B-25's were sent on detached service to the Bengasi and Gambut areas to strike at the enemy's Aegean shipping. The P-38's operated for only four days but claimed seventeen planes shot down; the Liberators and Mitchells remained through the month.<sup>7</sup>

The outstanding mission of the month was flown on 1 October against Wiener Neustadt. It was the third operation from the Mediterranean (the first two were the Ploesti attack of 1 August and the Wiener Neustadt mission of 13 August) undertaken in behalf of the Combined Bomber Offensive. The mission plan called for four groups of XII Bomber Command's B-17's to attack fighter aircraft plants at Augsburg and five groups of B-24's, which included the three on loan from the Eighth, to attack plants at Wiener Neustadt. Unfortunately, the B-17's failed to locate Augsburg because of a solid overcast, but many of them bombed alternate targets at Gundelfingen (Germany) and Bologna and Prato (Italy). A few others attacked transports and barges between Corsica and Elba. The B-24's, having found Wiener Neustadt, dropped 187 tons of bombs in the target area to damage assembly shops, storage areas, a hangar, and near-by rail lines. Both the B-24's and the B-17's ran into strong fighter opposition. The Fortresses were attacked over the Leghorn-Pontedera area by fifty to sixty planes,

## THE FIFTEENTH AIR FORCE

but with the help of P-38's eight enemy planes were destroyed and five probably destroyed for the loss of three B-17's. The Liberators met heavy flak and around sixty fighters, some with 37-mm. cannon in their wings and others which lobbed rocket-type shells into the bomber formation with considerable accuracy. Fourteen of the bombers were shot down and fifty-two damaged. Enemy losses were undetermined, but apparently did not equal the Liberator losses. After this mission the B-24's which had been borrowed from the Eighth Air Force returned to England.<sup>8</sup>

During the first week of October, Tactical flew around 2,600 sorties for the Fifth and Eighth Armies. On the 1st and 2d, 160 U.S. P-40's paved the way for an Eighth Army landing at Termoli on the Adriatic by bombing and strafing troops and vehicles on roads north and west of the town. On the day of the landing (3 October) and the day after, despite bad weather, fighter-bombers with some help from B-25's inflicted severe punishment on enemy traffic. Fighters and fighter-bombers then went all-out to help the Eighth hold the bridgehead against a series of hard German counterattacks. On the two most critical days, the 5th and 6th, Spitfires and P-40's of the RAF and the U.S. 57th and 79th Fighter Groups flew approximately 950 sorties over the battle area. They broke up the main enemy concentration, struck hard against road movement, especially around Isernia, flew direct-support missions over the battle line, and protected the ground troops against a few Luftwaffe raids. Without their efforts it is doubtful that the bridgehead could have been saved. After the crisis had passed, P-40's bombed the German escape route through Palata.<sup>9</sup>

NATAF's operations over the Fifth Army were more routine. Fighters and fighter-bombers bombed and strafed bridges, towns, junctions, enemy positions, and transport, while fighters flew defensive patrols over the ground troops and the Naples and Salerno areas. Even ordinary activities were curtailed for four days after the 8th as heavy rains held up the advances of both Allied armies and sharply limited air operations. Tactical's fighters and fighter-bombers got in a few licks in the eastern battle area, while small groups of B-25's, Baltimores, and A-20's attacked roads, troop concentrations, and gun positions from Capua in the west to Vasto in the east.<sup>10</sup> Strategic managed to make two attacks on Italian roads, Wellingtons hitting Formia and Terracina on the west coast, and to continue its operations against airfields in

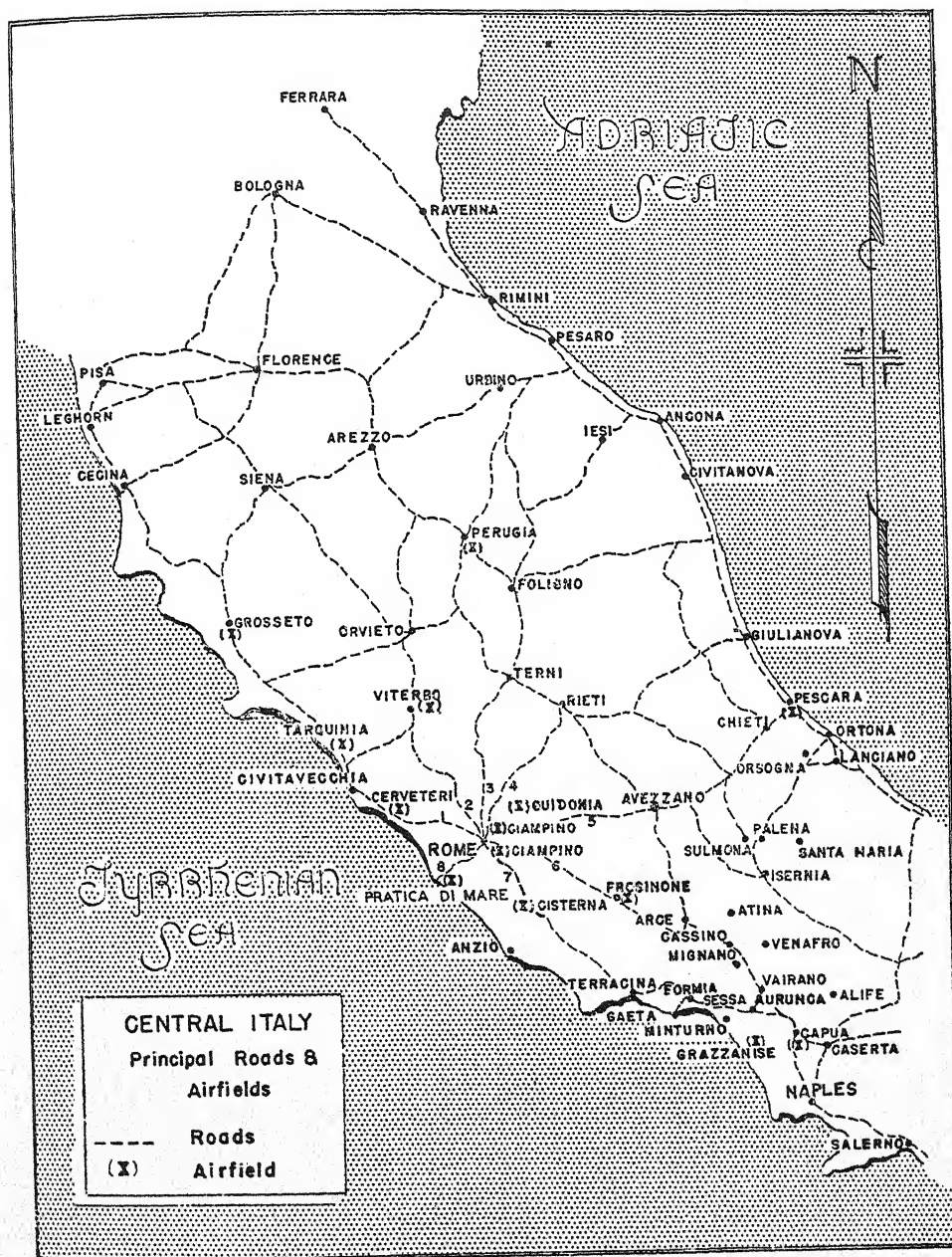


Greece and the Aegean. The GAF made so few appearances over Italy that not more than one Allied mission out of six saw enemy fighters.<sup>11</sup>

On the night of 12/13 October the Fifth Army attacked along its entire front in an effort to cross the Volturno.<sup>12</sup> The crossing would be accomplished by the 15th with but little aid from NAAF's planes, which were almost entirely grounded by the weather. The 13th was NAAF's best day, and then only 250 sorties were flown, half of them by P-40's. For each of the other two days, Tactical's fighters and fighter-bombers flew scarcely more than 100 sorties. Strategic's bombers made a few attacks against communications behind the German lines and against targets in the battle zone. The heaviest attack was against Terni, where thirty-four B-17's dropped 102 tons and met the first opposition in almost a week; thirty to forty enemy fighters attacked, losing two planes while shooting down one Fortress. Conditions were no more favorable in the Eighth Army sector. Strategic flew two small missions against the Ancona-Pescara-Foggia line of communication, the enemy's only primary line of supplies on the east coast, and Tactical operated on a limited scale against transportation. B-25's were able to fly two very successful missions against Tirana and Argos airdromes in the Aegean.<sup>13</sup>

For the rest of October the weather continued to limit NAAF's operations.<sup>14</sup> On the 15th and 16th, while the Fifth Army was consolidating its Volturno bridgeheads and beginning its effort to push Kesselring back, fighters and fighter-bombers of Tactical's 27th and 86th Fighter-Bomber Groups and 33d Fighter Group put in around 150 sorties against targets along the highways leading from Rome to the Volturno, and mediums flew 36 sorties, light bombers 96, and night-flying Bostons 16 in attacks on rail and road junctions between Rome and the bomb line. For the next four days, TAF continued to batter roads, rail lines, and towns immediately north of the Fifth Army, the targets being on or close to three highways which converged a few miles above Capua. On the 21st and 22d, with better weather, Tactical directed a heavy effort against the Cassino area. Between the 17th and 23d it also struck farther up the peninsula, hitting airdromes at Tarquinia, Viterbo, and Lake Bracciano and destroying some thirty enemy planes on the ground. The GAF was offering so little opposition that Tactical's bombers operating over the battle front now flew without fighter escort.<sup>15</sup>

On the Eighth Army front, from the 15th through the 22d, air



force operations were largely against the coast road in an effort to choke off Kesselring's flow of supplies into the easternmost part of the battle zone. P-40's also operated over the Adriatic, trying to interrupt enemy shipping to Italy, Greece, and Yugoslavia. On the 16th, P-38's of the 82d Fighter Group dive-bombed merchant vessels in the Levkas Channel. For the first time the Americans were escorted by Italian pilots, flying Macchi 205's.\*<sup>16</sup>

During the last week of October the weather relented enough to permit Tactical to fly almost its normal routine—of defensive patrols and reconnaissance missions; of attacks on strongpoints, bridges, transport, stores, dumps, gun positions, troops, roads, rail lines and locomotives, radio and weather stations, and airdromes; of escort and Rhubarbs.† On some days the weather sharply reduced the number of sorties, but there was never a day when TAF's planes failed to record at least a few blows against the enemy. And at all times they were so completely masters of the air over the battle areas that one German general, noting that "they pick out each individual vehicle" in strafing attacks, described their superiority as "terrible."<sup>17</sup>

NASAF during the latter half of October operated chiefly beyond a line running approximately from Rome northeast to the Adriatic.<sup>18</sup> The command's operations were divided between lines of communication—mostly rail lines—in central Italy, communications and airdromes in Greece and the Balkans, and airfields used by the German fighter force, chiefly in the Rome area, but the emphasis was on communications in Italy, principally a group of bridges in the area between Grosseto and Ancona.<sup>19</sup>

The emphasis on bridges marked a change from previous tactics in which NAAF had concentrated on key marshalling yards. Marshalling yards no longer appeared to be the best type of target for the interdiction of rail traffic. It was estimated that the Germans, fighting behind

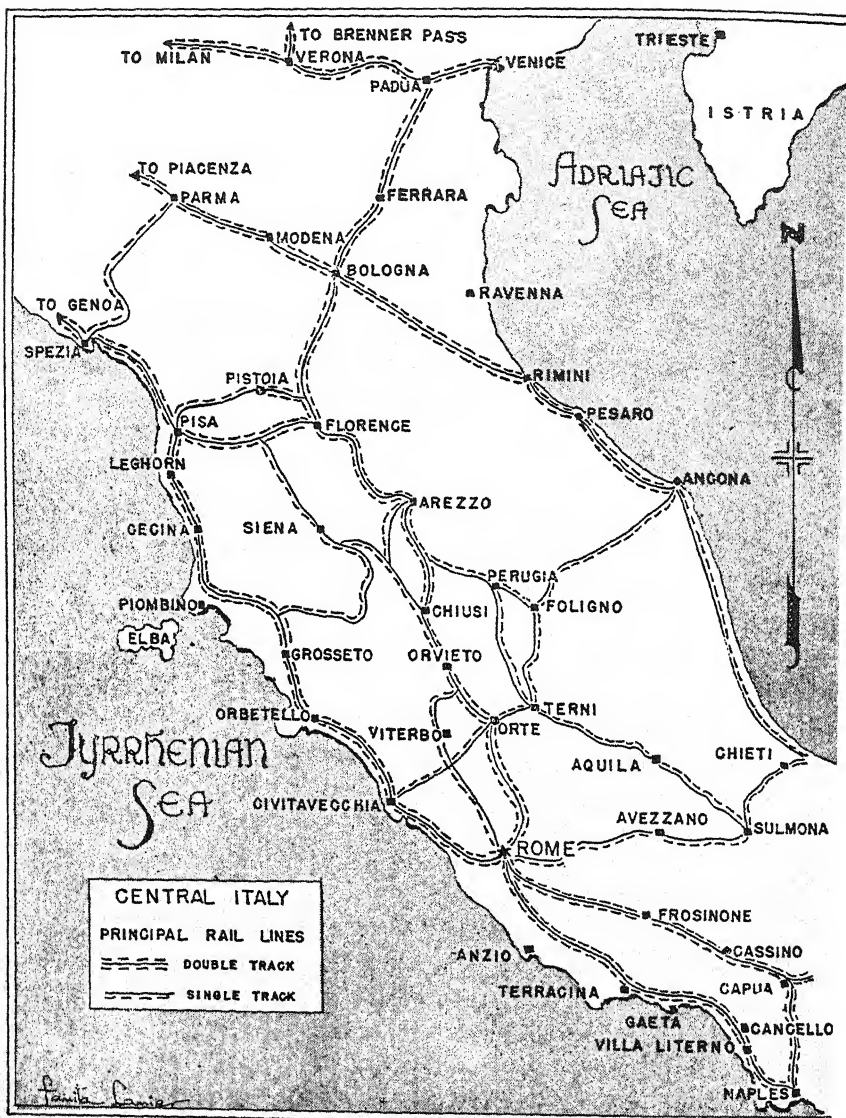
\* With Italy's surrender, Italian pilots had flown about 225 of their planes to Sicily; they had immediately started training to fly with NAAF but had been held out of combat pending an Italian declaration of war on Germany (which came on 13 October) and a favorable decision by AFHQ on their employment. Early in October, AFHQ decided to use five squadrons of fighters, one each of bombers and torpedo bombers, two of seaplanes, and half a squadron of reconnaissance aircraft, mainly in support of the Italian armed forces and the Balkan patriots, as couriers and for air-sea rescue. The IAF planes would be serviced by IAF specialists, many of whom were from the old Regia Aeronautica. The technicians proved especially valuable to the Allied air forces, with which the IAF continued to operate until the end of the war.

† In a Rhubarb a fighter or fighter-bomber, flying at very low altitude, attacks targets of opportunity, notably enemy movement.

good natural defenses, needed only forty tons of supplies per day for each division, so that their purely military needs could be supplied by about 5 per cent of the normal rail traffic from central Italy and the Po Valley.<sup>20</sup> Accordingly, to reduce drastically the flow of reinforcements and supplies it would be necessary for NAAF to cut a large number of rail lines and cut them quickly and as nearly simultaneously as possible—hence the decision to concentrate on knocking out bridges and sections of track so located that repairs would be difficult and time-consuming. Heretofore, it should be noted, the critical communications targets had been located in southern Italy, where to keep out of operation a relatively few marshalling yards had presented no such problem as did the numerous yards of central and northern Italy. Conversely, the railroads above a line from Rome to Pescara as they filed through mountain passes or along a narrow strip of coast offered many vulnerable targets—bridges, tunnels, and trackage along the precipitous incline of a hill or mountain.

Fortunately, the targets were within reach. NAAF's heavies still were in Tunisia but within comfortable range. The three groups of B-26's (17th, 319th, 320th) operated from bases near Tunis but were preparing to move to Sardinia.<sup>21</sup> The B-25's were scattered: the 310th Group and part of the 321st were in North Africa, the remainder of the 321st en route to Grottaglie on the Heel; from Sicily the 340th already was en route to Grottaglie and the 12th would move to Foggia Main during the first week of November. The 47th Group's A-20's had been at Grottaglie since the end of September and currently were moving to the Foggia complex. The American units could also count on the assistance of the four wings of RAF Wellingtons, now based at Kairouan in Tunisia.

Ample escort fighters were available. XII Bomber Command's three groups of P-38's (1st, 14th, and 82d) and one of P-40's (325th) were on the mainland. Four of XII Air Support Command's five groups of fighters, the 31st (Spits) and 33d (P-40's) in western Italy and the 57th and 79th (P-40's) in the east, had been on the mainland since early in September, while the other—324th (P-40's)—was to move in before the end of October. Also available were the RAF Spitfires and P-40's of Desert Air Force in eastern Italy. The fighters of XII ASC and DAF on the east coast could fly escort beyond their sector when necessary, all of them being within range of the bombers' objectives. The construction of new airfields was proceeding slowly, but the fields in the



Naples and Foggia complexes and around Lecce and Grottaglie, although crowded, provided accommodations for all planes which currently could not operate except from bases on the mainland.<sup>22</sup>

NAAF's decision to concentrate on bridges was in line with current thinking in Washington. General Marshall cabled Eisenhower on 29 October suggesting that an increase of operations by medium, light, and fighter-bombers would take care of the needs of the Fifth and Eighth Armies, leaving the heavies free to attack the nine rail lines entering the Po Valley; specifically, he suggested that the simultaneous destruction of several adjacent bridges on each line would stop traffic for a long time. Brig. Gen. L. S. Kuter, AC/AS, Plans, had suggested in a memorandum for Marshall prepared on 27 October that the destruction of eleven bridges on nine major rail lines in northern Italy and five bridges on a line approximately Pisa-Ancona might "starve" the Germans into withdrawing into the Po Valley.<sup>23</sup>

When Marshall's message arrived in the theater, NAAF's program of bridge-smashing already had been in operation for ten days. Strategic started the assault on the 19th, and for five days bridges on the central Italian rail system took a hard beating. The heavies and mediums which staged the blitz flew around 650 sorties and dropped 1,350 tons of bombs. Damage was widespread, almost all rail traffic north of the Rome area being interdicted pending extensive repairs. The enemy was forced to resort to an increased use of motor transport and coastal shipping—which in turn were attacked by light and fighter-bombers.

Effective maintenance of the road blocks which had been imposed depended, however, upon continuing steadily and relentlessly the assault on the lines. After the 23d this became increasingly difficult. The weather was variable but generally so bad that it became the practice to give the heavy bombers as many as four alternative targets.<sup>24</sup> It grounded all of Strategic's bombers on the 27th and 28th, limited them to one mission on the 26th and again on the 29th, and on other days forced a number of planes to return without having bombed the primary target. On the four days of favorable weather which fell before the end of the month, Strategic continued to attack its targets of the preceding week. Six missions scored hits on three out of five bridges attacked between Grosseto and Ancona. Against a new set of targets farther north—between Pistoia and the French border—234 effective sorties unloaded 575 tons against Pistoia and towns along the Ligurian



coast: Genoa, Imperia, Porto Maurizio, and Varagge. The attack on Genoa was unusually heavy, 133 B-17's and 20 B-24's dropping 405 tons which severely damaged tracks, rolling stock, the Ansaldo steel works, the San Giorgio instrument factory, and electric and ordnance plants. Thus the interdiction program was extended to include the most direct line from Rome to northwest Italy and southern France. A third set of targets consisted of Civitavecchia and Anzio. The former took seven direct hits on rail lines and warehouses; the latter had all of the buildings on its north dock destroyed. An incidental advantage resulting from the bombings around Genoa and Imperia was the creation in the minds of the Germans of a fear that the Allies would launch an amphibious operation against the area between La Spezia and Imperia, a fear which would be present until the last days of the Italian campaign.<sup>25</sup>

It also proved possible for Strategic to undertake damaging attacks on German fighter bases in the neighborhood of Rome. Marcigliana and Casale each were attacked twice and Cerveteri, Furbara, Perugia, and Guidonia once each. B-17's, B-25's, and Wellingtons flew more than 250 sorties, dropping 400 tons of bombs. Some forty aircraft were destroyed on the ground, the fields were well postholed, and a number of installations were smashed or burned. Supplementary raids were conducted by U.S. A-20's and A-36's of NATAF, which attacked Tarquinia airdrome, airfields at Cassino and Aquila, and other fields or grounds near Civita Castellana, Cerveteri, Viterbo, Acquapendente, Tarquinia, and Sutri.

Continuing operations against the Balkans and Greece held significance chiefly for British forces on the islands of Samos and Leros, which the Germans had under air attack. The British rightly anticipated an early attempt by the Germans to seize the islands, and Strategic added attacks on communications targets to its Balkan airfield program. Hardest hit was Skoplje—a key city on the Nish-Salonika railway and the control point for all traffic from Yugoslavia to Greece—which was attacked by bombers and fighter-bombers on the 18th and by P-38's on the 21st in the first USAAF efforts against Yugoslavian targets.<sup>26</sup> In the bombing raid twenty-one direct hits were scored on the yards by thirty-six B-25's; in the strafing attack forty-three out of forty-four locomotives present in the yards were reported destroyed or damaged. On the 20th the Nish yards were bombed by B-25's which cut the main lines to Belgrade and Sofia at many points and by P-38's

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which left the roundhouse in flames. During the last ten days of October, NAAF's operations across the Adriatic were directed against airfields at Athens/Eleusis, Salonika/Seles, and Megalo/Mikra in Greece, Tirana in Albania,<sup>27</sup> and Podgorica in Yugoslavia. Results everywhere were excellent.

The attacks against Yugoslavian and Albanian targets were carried out by Italy-based planes, but most of the operations over Greece and the Aegean were by the USAAF B-24's and B-25's which had been transferred temporarily to Cyrenaica. Although they succeeded in destroying many GAF planes, they could not stop the Germans from continuing to bomb Samos and Leros so effectively that by the middle of November they were able to assault and take both islands.<sup>28</sup>

On 24 October one more mission was flown against Wiener Neustadt. A total of 111 B-17's and B-24's took off, but the target was hidden by 10/10 clouds so that only twenty-three Liberators of the 98th Bombardment Group bombed the objective and they did so by dead reckoning. Sixteen planes of the 301st went seven miles beyond Wiener Neustadt and hit Ebenfurth with excellent results. The weather kept the Luftwaffe grounded and there were no encounters. Strategic also flew a long-distance mission against the Antheor viaduct near Cannes in southern France on 3 October, thirty-eight B-17's placing a heavy concentration on the target and its approaches and scoring direct hits on tracks and near-by roads.

And so by the end of October,<sup>\*29</sup> NAAF's Strategic and Tactical Air Forces had established a pattern of operations that would endure with but little change almost to the following spring. Coastal, too, had its regular and routine duties, except that it had taken over from XII ASC the additional job of protecting harbors and other installations along the west coast of Italy. Photographic Reconnaissance Wing flew its daily missions, seeking out new targets and recording the damage done to old ones. Troop Carrier continued to bring in supplies and personnel and to take out wounded. On the ground, air service had

\* During the month, NAAF's planes flew approximately 27,000 sorties and dropped more than 10,000 tons of bombs. The USAAF's share was between 14,000 and 15,000 sorties and 8,000 tons. Around 160 enemy aircraft were claimed destroyed in combat, 30 probably destroyed, and 60 damaged. On the ground, some 160 were claimed destroyed, 40 probably destroyed, and 80 damaged. Against these victories, NAAF lost some 90 planes, the majority of them to flak. The brunt of operations was borne by Strategic and Tactical, but Coastal also put in a busy month, its planes flying 5,222 sorties, shooting down 22 enemy planes, and escorting ships an over-all distance of 1,400,000 miles with the loss of only 3 vessels.

settled down to the prosaic but vital jobs which kept the air elements in shape to fly.<sup>30</sup> The beginning of experimental supply drops to the patriot forces in France by modified B-24's of the 5th Bombardment Wing's special flight section was something new, but these operations would be on a small scale for many months.<sup>31</sup> Small, too, would be the scale of effort in behalf of the Combined Bomber Offensive. The weather continued to interfere, and the efforts of the air forces to break the stalemate on the ground in Italy and to aid allies in the Balkans would demand the chief efforts undertaken by all planes. As men waited out the weather and on the better days returned again and again to the same targets, they would come to know as much of the monotony of war as of the tension of battle.

### *Commitments to POINTBLANK*

Since the summer of 1942 a major consideration in the development of the Mediterranean strategy had been the capture of airfields from which Allied air forces could reach profitable targets in northern Italy, Germany, Austria, and the Balkans. And now that southern Italy had been conquered, one of NAAF's most important and urgent jobs was to repair and lengthen old fields and construct new ones for use by the units of Strategic, which continued to operate from bases in Tunisia. The responsibility devolved largely upon American aviation engineers, who, with assistance from British airdrome construction groups, had prepared before the end of October enough fields on the mainland to take care of the immediate needs of Tactical's planes.<sup>32</sup> The burden upon the engineers became the heavier because of a decision to undertake a program of airfield development on Sardinia and Corsica. The work to be done on Corsica—whose occupation by the Allies was completed only during the first week of October—would be especially heavy. The Axis had made little use of the island save as an intermediate air base for planes flying from France to southern Italy and for bombers returning from missions over Sicily and North Africa. But Corsica's location would make it very useful to the Allies for air operations against northern Italy and southern France, and its fields, together with those on Sardinia, would relieve much of the pressure on the Italian fields.

Before 22 October all U.S. aviation engineers in the theater had been under the engineer of the Twelfth Air Force, who also was the engineer of XII AFSC. On that date the XII Air Force Engineer Command

## THE FIFTEENTH AIR FORCE

(Prov.) was activated, and on the 26th it was assigned to the Twelfth Air Force. This new arrangement gave command status to the engineer, accorded him authority equal to his responsibility for airfield construction, and made it easier for him to obtain supplies and equipment. Various U.S. aviation engineer units in the theater were promptly assigned to the new command. On 4 November, Brig. Gen. Donald A. Davison became commanding general. Area engineers were then appointed for the west Italy, east Italy, Sardinia-Corsica, Northwest Africa, and Sicily areas. Subsequently, in November and December, the Sardinia-Corsica area was split into two areas, and a south Italy area was created, so that by the end of 1943 there were seven areas.<sup>33</sup>

The new command held responsibility for all airfield construction required by NAAF except the fields for Desert Air Force in eastern Italy, which were to be handled by the British. Near the end of October the engineers began the construction of heavy bomber fields around Foggia, in the Heel, and in the Cerignola area and medium bomber fields in Sardinia and Corsica. In spite of great difficulties imposed by rain and mud, insufficient equipment and personnel, and poor transportation (especially in Corsica where the Germans had blown every bridge, the one railway, and the roads and where there was only a single port on the east coast), the engineers during November and December completed or were in process of completing construction on more than forty-five airfields. The work ranged from repairs and drainage to building paved or steel-plank runways as much as 6,000 feet in length.<sup>34</sup>

A second major activity of XII AFEC was the construction of pipe lines for aviation gasoline. In October, an Engineer Petroleum Distribution Company began laying lines and setting up pumping stations in the Foggia area, and in December a second company started to lay pipe in the Heel. By 25 November the first line had been completed and was in operation; it ran from Manfredonia to Foggia and could move 160,000 gallons of 100-octane gasoline each week. By the time NAAF's heavy bombers were ready in December to move to their new fields in eastern Italy the problem of keeping them supplied with gasoline had been solved. Use of the pipe lines reduced the tonnage to be off-loaded at ports and relieved road and rail transportation of a heavy burden.

A pipe-line system also was set up along the east coast of Corsica, running from Bastia—the only port on that side—to the complex of airfields around Ghisonaccia. A small system was established at Naples.

Maintenance of the lines, and more particularly the handling of the gasoline at the fields, was the responsibility of XII Air Force Service Command. Both the engineers and service command were able to supplement their limited personnel by employing along the lines and at the airfields small numbers of French aviation engineers on Corsica and by using large numbers of Italian prisoners of war in Italy, Sardinia, and North Africa.<sup>35</sup>

The development of air bases in Italy not only created problems of airfield construction and of moving gasoline but also of handling supplies for the air forces, a problem which proved to be a peculiar one in eastern Italy. That area was to be a great base for the USAAF, the Mediterranean home of its heavy bombers. But eastern Italy was under the jurisdiction of the British because their Eighth Army was operating there; consequently, the American Services of Supply would not establish a base section for handling supplies common to ground and air, although British common items were altogether unsatisfactory to the American air units. The problem was solved by establishing the Adriatic Depot at Bari, a depot that operated under the control of XII AFSC but was staffed largely by ground forces service personnel. It got under way late in October and by the end of the year was supplying American air units with common items from numerous offices, warehouses, and dumps in and around Bari. Few operations in the Mediterranean were more unique—or more successful—than the depot, in which the American air forces ran a ground force activity in a British-controlled area.<sup>36</sup>

An operation somewhat like that of the Adriatic Depot took place in Corsica where the 320th Service Squadron, at Ajaccio, not only performed normal air service duties but also functioned as a base section from October 1943 until late in February 1944 when the Northern Base Section was activated.<sup>37</sup> In fact, Corsica became distinctly an AAF responsibility. Its Allied garrison commander was an AAF officer. By the end of the year the 350th and 52d Fighter Groups were operating from the island, and 47 units and close to 10,000 men of XII Air Force Service Command were servicing its fields, most of which were along the east coast from Bastia southward.<sup>38</sup> Similarly, in Sardinia, where there were no Allied ground troops, the air forces handled all military matters, Brig. Gen. Robert M. Webster, commanding the 42d Bombardment Wing, being the island's Allied garrison commander.<sup>39</sup>

The Mediterranean Air Transport Service, which had been devel-

oped for the control of intratheater air transport, had established a service to Italy in October. In November, its services were extended to Sardinia and Corsica. A conference of 2 November, attended by Spaatz and Tedder, had decided that MATS should gradually turn over all of its North African traffic to ATC and RAFTC. Under the plan adopted, MATS by 1 January 1944 would operate only from North Africa to Italy and the islands of Sicily, Sardinia, and Corsica and maintain services between these points. An advance headquarters previously established at Naples became on 31 December the Continental Division of MATS.<sup>40</sup>

All this—the construction of airfields and pipe lines, the organization of special supply facilities, and the adjustment of Allied forces—acquired additional importance as the result of a decision to base a part of the Combined Bomber Offensive on Italy. At the QUADRANT conference in August 1943, POINTBLANK, with its objective of achieving the progressive destruction of Germany's economic and military power, had received the highest strategic priority as a prelude to the cross-Channel invasion of western Europe (OVERLORD).<sup>41</sup> The particular developments which gave rise to a specific plan to base a large force of strategic bombers committed to POINTBLANK in Italy is considered elsewhere,\* but it is pertinent here to consider the effect of that decision on the operations and organization of USAAF units in the Mediterranean.

Three weeks before the opening of QUADRANT, General Arnold had seemed to doubt that strategic bombardment from Italian bases could accomplish much. But it soon became evident that he was looking toward the creation of an over-all command to control all CBO operations, one under whose direction bomber units could be moved between England and Italy as weather and the choice of targets dictated,<sup>42</sup> and at QUADRANT he questioned that the maximum use of heavy bombers committed to POINTBLANK could be made during the coming winter from English bases. Air Chief Marshal Portal agreed. In his opinion, the reduction of the German fighter force was of special urgency, for unless the fighters were "checked in the next three months, the battle might be lost." From bases in northern Italy, he argued, all of southern Germany would be within comfortable range, two of the largest German aircraft factories—which together produced almost 60 per cent of the enemy's fighters—could be reached, and

\* See below, pp. 715-24.



Ploesti would be much easier to attack; half of the GAF's fighters currently facing the United Kingdom would have to be moved to the southern German front; and bombers flying from Italy would enjoy the shield of the Alps against the German radio warning system. The Americans expressed agreement with these thoughts, though they believed that the air offensive could be as effectively prosecuted from fields immediately above Rome as from bases north of the Po River, which the British had considered desirable.<sup>43</sup>

Within a month after QUADRANT both Eisenhower and Spaatz had indorsed Arnold's plan to use Italian fields as bases from which to bomb German-held Europe. In a message to Marshall, Eisenhower noted a number of the advantages which had been mentioned by Portal and argued that a more intensive air effort against Germany could be maintained with proportionately smaller losses if a substantial part of the heavy bomber effort were applied during the winter from Italian bases. He pointed out, however, that new fields must be built, runways extended, and additional steel mat shipped in.<sup>44</sup>

By October plans were reaching their final form. On 9 October, Arnold submitted to the JCS, and subsequently to the CCS, a plan for splitting the Twelfth Air Force into two air forces—one tactical and one strategic—in order more effectively to carry out the Combined Bomber Offensive in conformity with the decisions made at QUADRANT. In support of the plan, he argued that by utilizing Italian air bases important targets beyond the range of bombers from the United Kingdom could be destroyed, enemy air and ground defenses dispersed, shuttle bombing made possible, and the offensive need not be held up by adverse weather in one theater. He recommended that the Twelfth become the tactical force and that a new strategic air force be established as the Fifteenth Air Force. Both forces would operate under the direction of the theater commander, but the Fifteenth from time to time would be given directives by the CCS governing its employment in the CBO. The six groups of heavy bombers presently assigned to the Twelfth would serve as a nucleus for the Fifteenth, and fifteen additional groups would be diverted from current allocations to the Eighth.<sup>45</sup>

Strenuous objections to the proposal came from General Eaker in England.\* Alarmed at the prospect of losing bombers previously earmarked for the Eighth Air Force, he argued that the proposal, in violat-

\* See below, pp. 725-26.

ing the principle of concentration of force, would jeopardize POINT-BLANK and so OVERLORD itself. He doubted that the necessary fields could be provided in Italy and that the problem of providing facilities for heavy maintenance could be overcome. He questioned too that the weather of Italy would prove generally more favorable for bombing operations.<sup>46</sup> General Doolittle, on the other hand, joined Spaatz in his indorsement of the proposal. Doolittle maintained that for purposes of high-level bombardment of targets in southern and eastern Germany and the Balkans during the winter months the prospect favored Foggia as a base "from two to one to three to one" over bases in the British Isles. He felt that there would be little advantage in one area over the other during the summer, but he estimated that from 1 November to 1 May the number of days on which bombers might be expected to operate was fifty-five for those in Italy against thirty-one for those based in the United Kingdom. The general supported his argument by noting that winter storm tracks were more frequent and more severe in England than in eastern Italy; that Foggia was better protected from the weather than were the East Anglian bases; that icing below 10,000 feet was worse over western Europe because planes had to pass through cold fronts, whereas from Foggia they generally could fly between fronts; and that in the Balkans some of the best weather was experienced during the winter months.<sup>47</sup>

Following discussions with Spaatz and Maj. Gen. W. Bedell Smith (Eisenhower's chief of staff) in Washington, the JCS approved Arnold's plan and on 16 October sent to Eisenhower a proposed directive for the establishment of the new air force. The Fifteenth, to be created from the XII Bomber Command, would be under the command control of NAAF and when necessary could be used in support of ground operations, but its primary mission would be strategic bombing.<sup>48</sup> On 22 October the question came before the Combined Chiefs of Staff, who exercised an ultimate control over the CBO. Agreement there was reached on the establishment of the force with its proposed build-up, but with a proviso (introduced by Air Marshal Welsh) that if "logistical potentialities" in Italy developed more slowly than was anticipated, the bomber groups for which there were no accommodations would be sent to the United Kingdom.<sup>49</sup>

On that same day, 22 October, a cable to Eisenhower informed him that effective 1 November the Fifteenth Air Force (Strategic) would be established under his command. The provisions contained in the

proposed directive of 16 October were made more specific: the new air force would consist initially of six heavy bomber groups and two long-range fighter groups presently assigned to XII Bomber Command; by 31 March 1944 it would be built up to twenty-one bomber groups, seven fighter groups, and one reconnaissance group. These forces would be employed primarily against CBO targets as directed by the CCS, but the original units might be used, even chiefly, against objectives other than those called for by POINTBLANK until such time as air bases above Rome had been secured. In the event of a strategic or tactical emergency the theater commander in chief was authorized to use any part of the Fifteenth Air Force for purposes other than the primary objective. Coordination of operations with the Eighth, for the time being at least, would depend upon liaison.<sup>50</sup>

The decision did not pass without further objections from the ETO. Portal, who earlier had favored the plan, expressed strong opposition, as did Eaker and Harris. They were afraid that the build-up of the Fifteenth would cripple the CBO and jeopardize OVERLORD, and they did not believe that Italy either offered a better base for operations than did the United Kingdom or would be able to handle fifteen additional groups of heavies.<sup>51</sup> But, again, there was renewed approval from the Mediterranean, Spaatz and Doolittle—like Arnold—believing that the Combined Bomber Offensive should be conducted from both theaters.<sup>52</sup> And at this point the British chiefs, apparently convinced that the Fifteenth would be established “whether or no,” announced that they “welcomed” the idea. The Prime Minister also approved, provided the build-up of the new air force did not interfere with the battle for Rome and the airfields of central Italy.<sup>53</sup> The support in British quarters for Eaker’s views seems to have caused Arnold to seek additional assurance from Spaatz that preparations in the Mediterranean for the proposed build-up of the Fifteenth could be made. This assurance having been given by Spaatz on 30 October,<sup>54</sup> Arnold in a reply on the following day indicated that he had refused to reopen the question of basing the additional groups of heavies in the Mediterranean because of Spaatz’ assurance that he could handle the build-up on schedule.<sup>55</sup>

On 1 November, pursuant to the CCS directive of 22 October, Eisenhower announced the activation of the Fifteenth. Spaatz was designated commanding general of the USAAF in the theater, and he in turn named Doolittle as the commanding general of the Fifteenth. Until administrative procedures could be clarified,<sup>56</sup> Spaatz would continue

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in command of the Twelfth.\*<sup>57</sup> Doolittle assumed command that same day and appointed Brig. Gen. Earle E. Partridge as his chief of staff.<sup>58</sup> Physically, Headquarters, Fifteenth Air Force, was the same as Headquarters, NASAF, and Doolittle served both as commanding general of the Fifteenth and as commander in chief of NASAF.

When the Fifteenth was activated its headquarters was in the Lycée Carnot in Tunis, where the headquarters of the XII Bomber Command had been located. But an advance echelon had already been established at Bari, and on 22 November orders were issued for the entire headquarters to move there, beginning 30 November. The movement, except for motor vehicles, was handled by planes of Mediterranean Air Transport Service; it was completed on 3 December, except for a rear echelon of fifty troops who did not complete their move until 18 December. On 1 December, the headquarters officially closed at Tunis and opened in Bari, where it remained until the end of the Italian campaign.<sup>59</sup>

The initial personnel and equipment of the Fifteenth came from the Twelfth Air Force. The Headquarters and Headquarters Squadron and the original tactical units were taken over from XII Bomber Command. The tactical units consisted of six heavy bombardment groups, five medium bombardment groups, and four fighter groups, divided among three wings. With the exception of the 82d Fighter Group and the headquarters of the 47th Wing, both of which were in Italy, all of the Fifteenth's tactical units were in Tunisia. Plans called for the 5th Wing and its four groups of B-17's and two of fighters to be moved to the Foggia area, the 47th Wing with its two groups of B-24's and one

\* Administrative control of the new air force went from North African Theater of Operations, U.S. Army (NATOUA) to Twelfth Air Force to Fifteenth Air Force until 21 December, when the Fifteenth was removed from all control by the Twelfth and the Twelfth became a purely tactical air force. On that date the administrative channel was changed to NATOUA—Army Air Forces, North African Theater of Operations (AAF/NATO)—Fifteenth Air Force, with the Twelfth having the same channel, the two air forces now being coequal commands. On 1 January 1944, AAF/NATO was replaced by AAF/MTO, but without changing the administrative setup. Operational control as of 1 November 1943 within the area under the operational jurisdiction of AFHQ (Italy, southern France, the Balkans) was: AFHQ—MAC—NAAF—NASAF—Fifteenth, and AFHQ—MAC—NAAF—NATAF—Twelfth. Effective 10 December 1943, MAC and NAAF were combined to form Mediterranean Allied Air Forces (MAAF), and the operational channels then became: AFHQ—MAAF—MASAF—Fifteenth, and AFHQ—MAAF—MATAF—Twelfth. Operations outside of the area controlled by AFHQ were coordinated with the Eighth Air Force by direct liaison. This arrangement continued until 6 January 1944, when the United States Strategic Air Forces in Europe (USSAFE, later USSTAF) was established; thereafter, the chain of command was USSAFE (USSTAF)—MAAF—MASAF—Fifteenth Air Force.

of fighters to be based in the Heel of Italy, and the 42d Wing of B-26's to operate from Sardinia.<sup>60</sup>

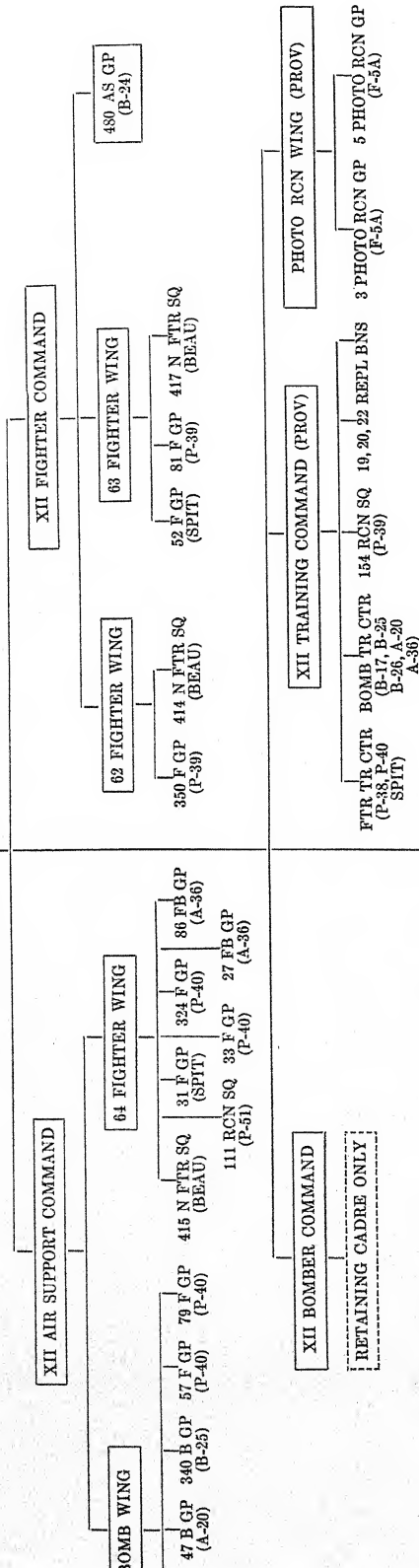
The expectation that all of the Fifteenth's units would move quickly northward was not to be realized, for difficulties were encountered in addition to those which normally would be expected to impede such a large movement. Among the delaying factors were failure to obtain prompt approval for the requisitioning of buildings, slowness in enlarging and lengthening old fields, and delays in preparing new ones. Inability of the hard-working engineers to ready the fields is explained primarily by bad weather, plus the fact that only a few of the Italian fields initially were capable of handling four-engine bombers. Not until the end of December was it possible to complete the transfer of all of the Fifteenth's heavies from their old Tunisian bases to the Foggia and Manduria areas and its B-26's to Sardinia. After the movement northward, Tunisia became a staging area for new heavy bombardment groups arriving from the United States preparatory to their final movement to the Fifteenth.<sup>61</sup>

Fortunately, the build-up of the Fifteenth Air Force proceeded at a pace which did not outdistance the engineers in their preparation of fields and other facilities. AAF Headquarters had planned to divert three B-24 groups from allotments to the United Kingdom for shipment to the Mediterranean in each of the three months from November through January 1944; in each of the two following months there would be sent three groups of heavies to total fifteen new groups.<sup>62</sup> The 449th, 450th, 451st, 454th, 455th, and 456th Bombardment Groups (H), each with sixty-two B-24H aircraft, were scheduled to leave the United States for the Mediterranean before the end of December. But though the first three of these groups reached the theater in mid-December, the others did not come in until mid-January. The 332d Fighter Group with seventy-five P-39Q aircraft, also scheduled for December, did not reach the Fifteenth until February. On arrival, it absorbed the 99th Fighter Squadron (Separate), which had been in the theater since April 1943.<sup>63</sup>

Also in November the Fifteenth was allocated for December and January a total of 739 B-24's with 937 crews and 200 B-17's with 178 crews; and for February and each month thereafter 171 B-24's with 217 crews and 60 B-17's with 87 crews. Filler personnel for December through February would amount to 572 officers, 37 warrant officers, and 7,043 enlisted men. In addition, the War Department authorized

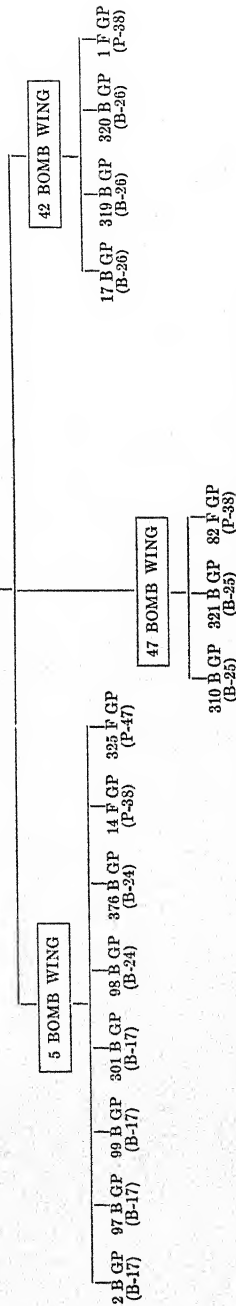
# TWELFTH AIR FORCE

1 NOVEMBER 1943



# FIFTEENTH AIR FORCE

1 NOVEMBER 1943



TO BE RETURNED TO TWELFTH AIR FORCE ON 3 NOVEMBER



the constitution and activation by the end of January of four heavy bombardment wings, two air depot groups, and three air service groups. The expansion of the wing organization of the Fifteenth began on 29 December when the 304th and 305th Wings were activated.<sup>64</sup>

The fighter force did not begin to expand until April 1944, although—next to decent weather—the Fifteenth's greatest need in its early days was for more escort fighters. In the beginning it had only four groups, at about half strength, when it needed seven at full strength. It might appear that with fourteen groups in the theater there were enough fighters to take care of both the Fifteenth and the Twelfth. Actually, such was not the case, for not only was there an over-all shortage in the theater of more than 200 fighters but the total number of available groups was far from a true index of the theater's fighter strength. For one thing, eleven of the fourteen groups had short-range P-39's, 63's, and 40's, medium-range A-36 fighter-bombers and Spitfires, and early-model P-51's; only three groups had P-38's, which alone were suitable for long-range escort. True, the P-40 groups were being re-equipped with P-47's, but the transition was only beginning. For another thing, five of the eleven non-P-38 groups were scheduled to be transferred to the United Kingdom and CBI. Thirdly, because of heavy losses suffered by the Eighth Air Force during the summer and early fall and the critical need of the Eighth for a fighter with longer range than the P-47, it had been decided that all P-38's and P-51's which were scheduled to go to the Mediterranean in October, November, and December would be sent instead to ETO, with NAAF receiving P-47's in their place. This would reduce the number of fighters available for combat until the P-40 pilots had completed the training incident to changing over to the Thunderbolts; it also would hurt the operations of NAAF's two A-36 fighter-bomber groups, which needed some of the P-51's as replacements.<sup>65</sup> Eventually, the Fifteenth received enough long-range escort fighters to meet its needs, but in the meantime the scope and success of its operations were somewhat reduced.<sup>66</sup>

The photo reconnaissance group which had been stipulated in the CCS cable of 22 October was not given to the Fifteenth until eleven months after the air force was activated. Meanwhile, from 1 November to late in December 1943, photo reconnaissance was supplied by NAPRW. Beginning on 28 December, reconnaissance of strategic targets was handled by six aircraft from the 15th Combat Mapping

Squadron (of the 5th Photo Group, 90th PRW) which was assigned to the Fifteenth in January 1944.<sup>67</sup>

Since 23 October, when Spaatz had informed NAASC of the plan to base additional groups of heavies in Italy, action had been taken to provide necessary service facilities. General Depot No. 5 was established at Bari on 24 October, and Brig. Gen. Harold A. Bartron, commanding XII AFSC, was planning to move to Italy before the end of November three depot groups, five service squadrons, and more than a hundred other service units in addition to those already on the mainland; early in December he stated that he expected to operate a subdepot at Foggia and one at Gioia for the Fifteenth. Until December air service responsibilities on the mainland rested with III Air Service Area Command (Sp.). But II ASAC soon would take over in eastern Italy; on 3 December it was transferred with all its units from the Twelfth Air Force (and XII Air Force Service Command) to the Fifteenth Air Force. The change was distinctly administrative. The headquarters and units of II ASAC already were in northeastern Tunisia where they had been servicing XII Bomber Command for months; hence, after the activation of the Fifteenth, II ASAC simply continued to maintain service facilities for the tactical units of the old bomber command under its new designation. On 8 December, headquarters of II ASAC moved to Bari, where it remained until the end of the war; by the end of December most of its units had moved to eastern Italy.<sup>68</sup>

As a result of all these developments the Fifteenth by the end of December had grown from an initial strength of 3,624 officers and 16,875 enlisted men to 4,873 officers and 32,867 enlisted men. Its expansion actually was greater than the figures indicate, because on 3 November two of the groups of medium bombers (B-25's) which had been assigned to it on 1 November had been returned to the Twelfth\* without having flown a single mission for the Fifteenth. Then, early in January 1944, after three new groups of heavies had arrived in the theater, the 42d Bombardment Wing (M) and the remaining three groups of mediums (B-26's) were returned.<sup>69</sup> It appears that the mediums were given to the Fifteenth primarily to provide the new air force with experienced wing organizations and to permit the use of the mediums in counter-air operations. The nature of the strategic objectives laid down for the Fifteenth, which emphasized the use of heavy bombers, made it logical for the mediums to be returned to the Twelfth

\* See chart, p. 569.

for tactical employment.<sup>70</sup> But as a result of the loss of the mediums, the slowness with which new groups of heavies arrived, and the failure of new fighter groups to come in, the Fifteenth had only 564 assigned aircraft at the end of December as compared with 931 on 1 November.<sup>71</sup>

Meanwhile, on 5 November, the CCS had issued a directive which called for coordination between the Eighth and Fifteenth in order to expedite POINTBLANK and provided that a priority list of CBO targets should be established for the new air force.<sup>72</sup> Accordingly, Air Chief Marshal Tedder and Generals Spaatz, Eaker, and Doolittle met at Gibraltar on 8 and 9 November to arrange for coordination between the two air forces, for allocation of POINTBLANK targets, and for a continuing interchange of ideas, experience, and data. The target systems to be attacked under the CBO plan having already been set up on the basis of extensive study, the conferees faced principally a problem of allocating specific targets between the two forces. Geographical considerations naturally tended to govern the allocations, and for the time being at least each force was left to establish its own priorities among the targets allocated to it. The newness of the Fifteenth and its commitment to objectives other than those of the CBO seem to have argued against an immediate attempt to effect some closer coordination of efforts with those of the Eighth Air Force. Insofar as the Mediterranean itself was concerned, the Fifteenth continued to serve as the American element of NASAF.

Subsequent to this conference, a NAAF directive of 14 November set forth the main objectives of the Allied air forces in the Mediterranean with the following order of priority: (1) to destroy the GAF in the air and on the ground, wherever it might be reached by NAAF's planes; (2) to support the Italian land campaign; (3) to participate in POINTBLANK, by the destruction, among other targets, of fighter aircraft plants, ball-bearing plants, oil, rubber, and munitions; (4) to weaken the German position in the Balkans.<sup>73</sup>

Objective No. 2—support of the land battle—was primarily the responsibility of Tactical Air Force. However, Strategic would operate against lines of communications above a line Civitavecchia-Ancona, with the B-26's taking this as their primary task. In this connection it should be noted that Eisenhower, in discussing with the CCS the build-up of his air forces, had wanted it "clearly understood" that the increase was not altogether for use in POINTBLANK but that much of it was for the purpose of assisting the land battle. Objective No. 4—

operations over the Balkans—also was assigned to TAF, except for such special missions as might be given to Strategic. Important objectives which could be reached only by heavies—such as the Ploesti oil refineries and the Sofia marshalling yards—were to be assigned specifically to Strategic.<sup>74</sup> SAF had a primary responsibility for the other two missions: the destruction of the GAF in being and in production, and participation in the achievement of the still broader objectives of the Combined Bomber Offensive. If the initial emphasis tended to fall on the first of these missions, which promised substantial benefits for ground and other operations within the Mediterranean itself,<sup>75</sup> the tendency reflected also a general inclination at the time to regard the primary task of the CBO to be that of overwhelming the GAF as an indispensable preliminary to OVERLORD.\* Indeed, POINTBLANK, the code name for the CBO, would come in the usage of the next few months to mean for most persons the attack on the GAF.

Strategic was to wreck the GAF by destroying aircraft in the air and on the ground, by smashing fighter factories, air depots, aviation repair facilities, warehouses, and hangars, and by attacking ball-bearing plants. The destruction of planes on the ground would be accomplished by bombing and strafing airfields and depots. The assault on fighter production would be directed primarily against airframe and assembly factories.<sup>76</sup> The main attacks to be delivered by the Fifteenth would be against single-engine fighter plants at Wiener Neustadt and Regensburg—which together produced an estimated 500 out of the enemy's total of 650 Me-109's per month—and at Brasov and Győr. Factories in Italy also produced some 200 single-engine fighters. Also within range of the Fifteenth's heavies were twin-engine fighter and jet fighter plants around Augsburg, Budapest/Csepel, Schwechat, Oberpfaffenhofen, and Friedrichshafen.<sup>77</sup> Ball-bearing targets at Steyr, Klosterle, Fuerstein, and Schweinfurt, as well as at Turin and Villa Perosa in Italy, lay within the reach of NAAF's B-24's and B-17's. Damage to the industry would affect not only aircraft but vehicles, tanks, heavy guns, and precision instruments.<sup>78</sup> Under the POINTBLANK counter-air program the Fifteenth in November and December was assigned seven specific targets: aircraft factories at Wiener Neustadt, Augsburg, Budapest, Steyr, and Regensburg and ball-bearing plants at Turin and Stuttgart.<sup>79</sup> Priority among these targets was subject to change

\* See below, pp. 707-15.

as considerations of weather, air force capabilities, and coordination with operations out of the United Kingdom might dictate.<sup>80</sup>

The remaining part of the POINTBLANK program called for attacks on the German economic, industrial, and communications systems, with emphasis on the sources of production of such war essentials as oil, rubber, and munitions. Within a 700-mile radius of the Fifteenth's bases around Foggia were twelve countries, enemy or enemy-occupied, containing a wide variety of economic, military, and political objectives. Already they contained dozens of top-priority targets, and more would be available as Germany continued to move small but vital segments of her industries to eastern Europe. AC/AS, Intelligence considered that "qualitatively" more of the important targets now were closer to Italian bases than to bases in the United Kingdom and felt that the bringing of such targets within effective range of NAAF's bombers was "one of the outstanding recent developments of the war." For example, 31 plants, producing an estimated 44 per cent of the enemy's crude and synthetic oil, were less than 600 miles from Foggia, and an additional 21 plants, producing 32 per cent, were within 800 miles. Production of the 52 plants was 11,825,000 tons of fuel per year.<sup>81</sup>

NAAF studied these potential target systems and began the preparation of an initial list of targets; reconnaissance would reveal additional objectives. It was NAAF's plan to give the heavies alternate targets for each mission so that a regular scale of operations could be maintained.<sup>82</sup> But weather and the demands of the Italian campaign so limited Strategic's CBO operations that it was well into 1944 before its heavies were able to devote more than a small part of their effort to attacks on industrial targets.

## CHAPTER 17

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### *OPERATIONS TO THE END OF THE YEAR*

THE creation of the Fifteenth Air Force had no immediate effect upon NAAF's operations. Nor did other factors affect in any readily perceptible way the pattern of operations established during October. If the interruptions of weather and the demands of a difficult ground campaign postponed the hope for a more active participation in the Combined Bomber Offensive, the successful defense by the Germans of a line running south of Rome upset Allied plans for locating air units in central Italy and forced NAAF to crowd its fighters, fighter-bombers, and tactical bombers into such fields around Naples and Foggia as the engineers had been able to make ready. The prior claims on shipping given in the circumstances to ground and tactical air units contributed further to a delay in the forward movement of Strategic's groups to Italy. The prospect for an early break in the situation became no brighter when one surveyed the equipment of Allied tactical air units. Not only did NAAF lack the number of fighters, fighter-bombers, Beaufighters, and reconnaissance planes it deemed necessary but a theater which had been deprived of its long-enjoyed priority faced now the fear-even of losing some of its units to other theaters.<sup>1</sup>

Fortunately, NAAF was not called upon to face a strong and aggressive air force in Italy. But an easily maintained superiority in the air over the battle area had little observable effect on the ground battle itself. A hopeful attempt to drive the German ground forces out of southern Italy, an attempt geared to a basic plan envisaging a breakthrough toward Rome, tended increasingly to become an effort looking primarily to the maintenance of steady pressure on a strongly en-



trenched enemy. The Germans had taken up strong positions extending across the narrowest part of the peninsula, from the Garigliano River on the west to the mouth of the Sangro River on the east, positions destined to be known as the Winter Line. Running for the most part through mountainous terrain, this line confronted the troops of the Fifth and Eighth Armies with the necessity of fighting from hill to hill—fighting which for the remainder of the year seemed to the troops engaged to accomplish little, for beyond each hard-won hill was another, and if the enemy surrendered possession of one line of defense, he had merely to build another on some conveniently situated range.

The German infantryman put up a stout resistance. Rain and mud became his allies; skillfully placed demolitions and road-blocks aided his defense. Except for the capture of Venafrò and Sessa Aurunca, the Fifth Army made little progress during the first half of November and failed in its attempt to take the hill mass between Mignano and the Garigliano River. For the rest of the month the Fifth's line scarcely moved; the weather was so bad that even patrol activity was curtailed and much of the Army's energies were absorbed in reorganization for a major attack scheduled for the end of the month. That effort, however, also failed. In December the Fifth Army took Mignano, San Pietro, and a number of important hills, but could neither cross the Liri Valley nor force its way over the Garigliano River. Meanwhile, the Eighth Army crossed the Sangro River and in December moved up the coast to above Ortona, but inland it was unable to pass Orsogna and found its way west along Highway 5 toward Rome blocked.

In these circumstances, the story of air operations tends to assume the aspect of a repetitious and monotonous routine. Perhaps what would be otherwise a wholly artificial breakdown into set periods of time will serve here as well as any other device for a quick summary of air force activity.

### *November*

Along the western half of the front from the 1st through the 15th, Tactical steadily attacked gun positions, road and rail bridges, vehicles, and bivouac areas along and close to the battle line.<sup>2</sup> These operations were handled by fighters and fighter-bombers, with some help from B-25's; in the first week, U.S. P-40's flew 500 sorties and U.S. and RAF Spitfires 700. Other B-25's, A-20's, and fighter-bombers went somewhat farther afield, striking at lines of communication and transport in

areas north of Rome and along the west coast road. Key roads around half a dozen towns were blocked. Wellingtons and A-36's hit airfields near Rome. Night-flying Mosquitoes bombed rail lines and strafed trains as far north as Genoa, Padua, Spezia, and Venice, attacked airfields at Tarquinia and Cerveteri, and shot up road transport around Rome, Spezia, and Terracina.

Near the end of the period the GAF was using around 100 fighter-bombers (Me-109's and FW-190's) from the Rome and Viterbo areas in attacks against Allied positions and against communications immediately behind the front. The scale of effort was usually low, but on two days it rose to between 80 and 100 sorties. The GAF accomplished little, its formations being met in almost all cases by Allied fighters and the enemy losing an estimated seventeen planes without shooting down a single Allied fighter. Tactical played safe, however, by sending its fighter-bombers on the 13th against the enemy's forward landing grounds at Aquino, Marcigliana, and Frosinone.

In the last two weeks of November the weather worsened. Tactical's operations in western Italy from the 15th through the 25th were the smallest to date, the 19th being the only day when the number of sorties was normal. On the 26th, 27th, and 28th the weather was better, and Tactical bombed enemy positions and mountain towns around Mignano, below Cassino, and south of Cerveteri and Valmontone and raided battlefield roads in preparation for the Fifth Army's drive against Mount Camino. Tactical also hit the Civitavecchia docks and Anzio harbor and struck hard at the bridges southeast of Minturno (immediately ahead of Allied troops) and at the west coast railway and bridges below Rome. For the three days, TAF fighters and fighter-bombers flew around 250 unmolested bombing missions and an equal number of defensive patrols and fighter sweeps, the latter usually culminating in strafing attacks on vehicles. On the last two days of the month the weather kept almost all planes on the ground.

It was a similar story, by and large, in the Eighth Army sector. But the weather there was slightly better and, because of a special effort made on behalf of the Eighth's drive against the Sangro River line, Tactical was more active in eastern Italy. Fighter and fighter-bomber operations were handled jointly by Desert Air Force and XII Air Support Command. The latter, originally scheduled for bases in the Naples area, now was spread all across the peninsula, behind both the Fifth and Eighth Armies.

Air cooperation with the Eighth Army was especially strong during the first three days of the month. Fighters flew over 900 sorties, USAAF light bombers around 300, and TAF mediums some 70. One major set of attacks was against concentrations, guns, infantry positions, and vehicles around Carpione on behalf of the Eighth's left flank, which was driving toward the important German supply base of Isernia; the second major set was against the enemy opposing the right flank's push across the Trigno River. In addition, fighters bombed landing grounds near Ancona and strafed lines of communication along the Sulmona-Avezzano route, while light bombers attacked roads and rails in the enemy's rear and B-25's bombed the yards and railway at Aquila. On the 3d, eleven requests for direct air support were received and acted on by fighter-bombers and mediums.

From the 4th through the 15th the weather was generally unfavorable, but fighter-bombers maintained a moderate effort along the coast and in the central mountains, attacking tanks, AA positions, trains and road transport, military billets, shipping in east coast harbors, and forward landing grounds, and light bombers attacked gun positions, railways, and troops. Light bomber operations around Palena were particularly heavy and successful.

In the third week of the month, in spite of discouraging weather, DAF's fighter-bombers were able to give some close support to the ground troops, and Spitfires got in a fair number of bomb-line and defensive patrols. Most of the offensive missions were over the British left flank for the purpose of softening resistance to the advance of the 8 Indian Division: gun positions at Arce and Perano and strongpoints at Rivisondoli and Barrea were the principal targets.

On the 21st, Tactical shifted the bulk of its operations to the right flank around Santa Maria, Poggiofiorito, and Fossacesia where the Eighth on the night of 19/20 had started a drive across the lower Sangro. The Eighth hoped to realize two immediate objectives: one, to pull German troops away from the Fifth Army front as a preliminary to an attack soon to be launched by the Fifth; two, to drive through the eastern end of the enemy's winter line. In the event of a breakthrough into the Ortona area it was planned to swing the Eighth west on Highway 5 in an effort to compel the enemy to withdraw north of Rome.<sup>3</sup>

On the 22d, Tactical strongly supported the Eighth's crossing of the river, sending B-25's, Baltimores, and P-40's to attack positions and concentrations adjacent to the coast. On the 23d all planes were

weathered in, but the next day B-25's bombed the enemy around Santa Maria and Fossacesia in an attack described by the ground troops as "magnificent," and more than 120 light bombers and P-40's gave close cooperation to troops which had crossed the Sangro. While the Eighth was consolidating its positions along the left bank, Tactical gave excellent support, medium and light bombers flying more than 450 sorties and P-40's almost 400 against defensive positions. Ground troops confirmed the fine results achieved. Meanwhile, B-25's of Tactical hit the Ancona yards and harbor, and night-flying Bostons attacked vehicles below Pescara.

On the night of 27/28 the Eighth launched an assault along the eastern half of its Sangro bridgehead, driving hard against the enemy's line on the high ground overlooking the valley. In spite of fierce German counterattacks the Eighth by the end of the 30th had taken Fossacesia, Santa Maria, Mozzagrogna, Romagnoli, and the entire ridge. In this drive the ground troops received tremendous help from Tactical's planes. The German lines already had been worked over by TAF, but from the 28th through the 30th its bombers and fighter-bombers continued to pound key points in the German defenses. Bombers flew around 400 sorties and fighter-bombers almost 800. A German ground officer declared that because of the air assault "counter attacks were impossible"; another remarked that "nothing can move"; and a third reported that his men, "at the mercy of the enemy air force," could no longer hold their positions "in the face of the bomb-carpet."<sup>4</sup> So severe were the air attacks that the enemy could never mass enough troops for heavy counterattacks, and the way was paved for the Eighth to drive through.

The advancing troops were given full cover from enemy air attacks. DAF's fighters claimed eight planes shot down, one probably destroyed, and eight damaged for the loss of two. Meanwhile, outside of the battle zone, sixty-three B-25's effectively bombed the road and rail bridges at Giulianova and thirty-six more hit the yards at Civitanova. A-20's continued their night attacks on rail and road movements and targets of opportunity to the north, seriously interfering with the movement of enemy reserves.<sup>5</sup>

Throughout November, Tactical, in addition to its principal task of working with the ground forces, engaged in a number of other activities. Its planes escorted bombers and protected Allied shipping in the Adriatic. They attacked enemy vessels, mostly in east-coast harbors.<sup>6</sup>

At night Bostons and Mosquitoes went as far as the Po Valley on intruder missions against transport and lines of supply. Tactical aided Allied naval operations along both coasts by diversions which included bombings and the dropping of flares and regularly flew Rhubarbs, escorts, patrols, and photo, tactical, and weather reconnaissance missions. Some missions went across the Adriatic, usually when adverse weather over Italy limited operations over and north of the battle zone. The harbor and shipping at Split were bombed and strafed by B-25's, A-20's, P-40's, and Baltimores. Metkovic, a center for vehicle concentrations, was attacked a number of times, one of the raids (on 6 November) destroying forty vehicles and damaging fifty. Other targets were the docks at Durazzo, Albania, the harbor and shipping at Zara, and the harbor and yards at Sibenik.<sup>7</sup>

During November, Strategic's operations were on a smaller scale than at any time since the Tunisian campaign. Its tonnage of bombs dropped was less than one-third the total dropped in September.<sup>8</sup> The reorganization attendant upon the creation of the Fifteenth Air Force and the move of units to Italy and the islands interfered with combat operations. Maintenance was so poor that up to 40 per cent of the bombers were returning without having reached the target. But still more serious in its effect on operations was the weather.<sup>9</sup> Strategic had to shift many of its missions from CBO targets to lines of communication in Italy; regardless of the weather some transportation target usually could be found.<sup>10</sup> These missions supplemented the work of Tactical on behalf of the ground campaign; they were in fact distinctly tactical operations, for their impact was on the battle front, where the tough going made welcome to both armies this enforced diversion from Strategic's proper program.

Strategic's attacks on communications were directed largely against railways in central and northern Italy. Seven main lines were particularly important to the maintenance of the German forces: Rome-Florence Directissima Line; Rome-Pisa; Florence-Pisa; Genoa-Pisa; Marseille-Genoa; Bologna-Rimini-Ancona; Arezzo-Foligno-Terni-Orte. During the month each of these lines, with the exception of the Marseille-Genoa, was hit. Targets included both yards and bridges;<sup>11</sup> thus the assault represented a combination of the tactics of September and of October.

The first phase of the attack ran from 1 through 6 November. The targets were in the north central sector, mostly along the coast and on

the Arezzo-Orte line. Results ranged from outright failure to extreme damage, the average being good. From the 6th to the 10th, Strategic passed up the railways for industrial targets, but for the next five days it again worked on lines of communication. The heaviest attack was on the 10th when 75 B-17's (another 25 were turned back by weather) dropped 218 tons of 500-pound bombs on the Bolzano yards, which were rendered largely inoperative. Lines to Innsbruck and Callendo were cut, and direct hits were registered on a road bridge.<sup>12</sup> Wellingtons, less restricted by weather than the day bombers, made uniformly successful attacks on bridges along the coast road. Twice Strategic went outside Italy: B-17's missed the Antheor viaduct near Cannes but cut the tracks and highway to the north, and Wellingtons attacked the viaduct and a railway bridge over the Var River north of Nice. The assault on Italian communications forced the Germans to an increased use of coastal shipping, to which Tactical soon gave special attention.<sup>13</sup>

From 15 November through the 22d, Strategic encountered unusually bad weather and having certain commitments in the Aegean was able only on the 18th and 21st to attack the Italian rail system. On the 18th, half of a force of forty-eight B-26's bombed the Grosseto yards where they inflicted considerable damage on sheds, sidings, freight yards, and warehouses. On the 21st the Marauders hit the Chiusi yards. The mission saw the GAF offer one of its few challenges to Strategic's operations during November, about a dozen fighters coming up. On the same day Strategic made one of its rare attacks on enemy communications along the east coast when twenty-five Marauders scored direct hits on a railway bridge at Fano, between Ancona and Rimini.

On the 22d the final phase of November operations against rail lines opened. Attacks were made intermittently to the end of the month and were directed against the Genoa-Spezia-Rome, Bologna-Florence-Rome, and east-coast routes. Around 160 sorties were flown by heavies and over 225 by mediums. The attacks, almost unopposed by enemy fighters, caused widespread damage on each of the three lines.

By the end of November the offensive had been sufficiently productive for General Eisenhower to feel that once the Allies were north of Rome it would be possible for NAAF to keep the Germans from bringing in any kind of supplies and that, with good weather for even as little as 50 per cent of the time, the rail lines could be completely and permanently severed.<sup>14</sup>

Between these attacks on communications lines, Strategic was able to



fly several POINTBLANK missions, more nearly consonant with the primary responsibility of the new Fifteenth Air Force—"the attainment of air supremacy through counter air force operations and the destruction of the enemy's aircraft production."<sup>15</sup> These missions included attacks on ball-bearing plants (supplementing those of the Eighth Air Force), an aircraft production plant, and airfields (the last being of immediate tactical, as well as of long-term strategic, importance). By the fall of 1943 it was becoming evident that the German aircraft industry posed a growing threat not only to the achievement of other CBO objectives but to OVERLORD itself.\* Much of this threat was attributed to three Me-109 complexes at Wiener Neustadt, Regensburg, and Leipzig.<sup>16</sup> The first of these was within range of NAAF's Tunisia-based heavies, and against that target the Fifteenth on 2 November struck its first blow on behalf of the Combined Bomber Offensive. The seventy-four B-17's and thirty-eight B-24's which flew the 1,600-mile round-trip flight dropped 327 tons of bombs which were credited with destroying a large aircraft assembly shop in the Messerschmitt factory and two flight hangars, with damage to a second assembly shop and a third hangar, as well as machine and assembly shops in the Henschel and Sohn and the Steyr-Daimler-Puch works.<sup>17</sup>

On the mission the Allies got a good idea of the importance which the enemy attached to his fighter-production facilities and of his willingness to employ large forces of fighters in the defense of key installations. An estimated 120 to 160 Me-109's and 110's, FW-190's, and Ju-88's attacked before, during, and after the bomb run. But the Americans claimed fifty-six planes destroyed, twenty-seven probably destroyed, and eight damaged. Losses were five B-17's and five B-24's destroyed and one B-17 missing, some of these being victims of flak, which was heavy and accurate over the target.<sup>18</sup>

The Wiener Neustadt mission was considered by the Fifteenth as the "outstanding event" of its first four months of operations.<sup>19</sup> It was estimated that the destruction laid upon the aircraft assembly units not only had eliminated 30 per cent of the total enemy production of single-engine fighters but would deprive the GAF of a future output of 250 fighters per month for several months—the plant was considered as having no further target value for four months—which would impair German defenses against subsequent attacks by the Eighth and Fifteenth.<sup>20</sup> General Arnold expressed the opinion to Spaatz that the

\* See below, pp. 714-16.

effects of this attack would "cost the enemy hundreds of fighter aircraft" with a saving of many lives "in our continued air war."<sup>21</sup>

As a part of the Combined Bomber Offensive the Fifteenth in November also made six attacks against factories producing ball bearings—two against Turin, two against near-by Villa Perosa, and one each against the Ansaldo steel works at Genoa and a ball-bearing factory at Annecy in southern France. The heaviest of the blows was against Turin on the 8th, the primary target being the Fiat works. This factory produced a majority of Italian bearings, and its output, together with that of Villa Perosa, was estimated to be almost 20 per cent of the antifriction bearings available to Germany.<sup>22</sup> The attack was made by eighty-one B-17's, whose 183 tons of bombs were considered to have accomplished such damage to the factory buildings as to have eliminated two months of output. In addition hits were scored on the near-by motor and aero-engine works and the Lingotto yards. The other five raids were on a much smaller scale and were interfered with by weather. None of the primary targets was hit, although there was some damage to adjacent buildings and yards. Even so, Air Chief Marshal Portal reported at the end of the month that even the comparatively light attacks made by NAAF on industrial areas had led the enemy immediately to transfer perhaps 200 planes to their defense.<sup>23</sup>

In attacking airfields, NAAF went for one or more of four main types: (1) those containing concentrations of operational aircraft; (2) those containing important installations suitable for major repair, assembly, or experimental work; (3) those presenting a combination of operational aircraft and important installations; (4) airdromes defending key target areas.<sup>24</sup> By way of illustration, the fighter bases around Viterbo and the bomber bases in the Po Valley were examples of type No. 1; Guidonia, the most important experimental station in Italy, was an example of No. 2; the Istres complex in France was typical of No. 3; and the fields around Rome, Pisa, and other vital industrial and transportation centers were examples of No. 4.

In the first two weeks of November, Strategic hit only three airfields, one each in Italy, Greece, and Albania. On the 16th, however, it launched the first of several heavy counter-air force operations by striking at fields in southern France from which enemy bombers had recently launched raids against Mediterranean shipping. Targets were the Istres complex, which was severely damaged by B-17's, and the field at Salon, hit effectively by B-26's from Sardinia in the first day-

light attack by mediums on southern France.<sup>25</sup> Enemy opposition to both missions was strong, but the destruction of thirteen fighters was claimed for the loss of two B-17's. Another Fortress was lost to flak and a B-26 had to crash-land in Sardinia.<sup>26</sup> On the 28th and 29th, Strategic flew two missions, against fields at Salon and Fiano-Romana, which were rendered abortive by solid clouds over the targets, but two others were carried out: Wellingtons attacked the Rome/Ciampino fighter base with poor results, and B-17's hit Grosseto with excellent results. The remaining counter-air operations were against fields in Greece and the Aegean, in a strong but futile effort to help the British who were being driven from Leros and Samos by German air and ground forces. The attacks, scattered over the period from 12 to 22 November, were coordinated with raids by planes of the Middle East. It was estimated that at least fifty planes had been destroyed or damaged on the ground.

In addition to its diverse operations against lines of communication, industrial plants, and the factories and fields of the Luftwaffe, Strategic flew a number of missions against other types of objectives. Perhaps the most important were two raids on Sofia. Designed to interfere with the movement of German transport into the lower Balkans, these missions also had political significance and were intended as an assault on the morale of the Bulgarian people. The impetus for the attacks came late in October from the CCS, who cabled General Eisenhower that, if possible, his air forces should administer "a sharp lesson" to Bulgaria.<sup>27</sup> The two attacks, carried out on the 14th and 24th, were directed against the marshalling yards which handled traffic on the Berlin-Istanbul line. The first was flown by ninety-one B-25's with P-38 escort; the bombs covered the yards at Sofia and caused fires and explosions there and at near-by Vrajedna airfield. The second, by B-24's, was largely unsuccessful. Only seventeen of the Liberators could locate the target, and they had to bomb through heavy clouds.<sup>28</sup> On the 24th, the Fifteenth struck at Toulon, home port of the Vichy fleet and an important submarine base. In spite of low visibility 103 B-17's reached the target and dropped 315 tons of bombs. A cruiser, a torpedo boat, a submarine, four smaller vessels, and several barges were reported sunk, five E- or R-boats probably sunk, and several other vessels, a submarine station, and dry docks damaged. One unit of Fortresses, unable to locate Toulon, unloaded on the Antheor viaduct.

Other operations by Strategic's planes included escort by P-38's for

mediums of Tactical operating along the coast of Yugoslavia and for IAF planes engaged in supply-dropping to the Partisans and in fighter strafing missions.<sup>29</sup> The Fifteenth also conducted three extensive nickeling operations, one of them for the purpose of encouraging passive types of sabotage by Italian laborers in German-held territory.<sup>30</sup>

Although air operations in November were smaller than they had been in the previous months of the Italian campaign, they were sizable.<sup>\*31</sup> In fact, the decline was principally in tonnage of bombs dropped, for the number of sorties—thanks to increased operations by Coastal—was almost as great as in October. CAF flew more than 7,000 sorties, over one-half of which were on convoy escort. Its operations included more than 200 air-sea rescue missions,<sup>32</sup> involving 62 searches and the rescue of 134 survivors, and 282 offensive sorties against gun emplacements, bridges, transport, airfields, grounded aircraft, harbors, and radar stations. Coastal even took on a new type of offensive operation by twice flying escort for B-25's. It also initiated a new system of antisubmarine operations known as the "Swamp Hunt," in which the planes after a sighting maintained a constant hunt, searching in increasing numbers and over widening areas until the U-boat was forced to surface.

The Allied air forces in the Mediterranean had completed during November their first year of operations since the landings in North Africa on 8 November 1942. A summary prepared for the twelve months may be of some interest for its indication of the scale of air force operations. The figures, which include those for NAAF, RAF Middle

\* NAAF planes flew close to 24,500 sorties. Tactical was far ahead of the other air forces, flying 13,000 sorties to Coastal's 7,400, Strategic's 3,200, and PRW's 750. Tabulation reveals that USAAF units flew around 13,000 sorties (54 per cent of the total); of these, 7,700 were flown for Tactical Air Force, 2,800 for Strategic, 2,300 for Coastal, and 200 for PRW. Tonnage of bombs dropped was slightly more than 8,500, of which planes of the USAAF dropped almost 80 per cent. Tactical's constant fighter-bomber operations on behalf of the ground forces, plus the limiting effect of the weather on Strategic's operations, permitted Tactical to lead the field in bomb tonnage with 4,500. In types of targets the final standing was: gun positions and camps, 1,678 tons; rail lines, 1,347; marshalling yards, 1,247; airfields, 1,074; industrial establishments, 828; port facilities, 814. The remaining tonnage was distributed among highways, cities and towns, transport, shipping, supply dumps, and miscellaneous targets. NAAF's losses came to 150 planes destroyed and missing and 277 damaged; many of the former and most of the latter were victims of flak. The USAAF lost 80 planes and had 216 damaged. In addition to these operations, Troop Carrier flew close to 18,000 hours, hauled over 4,200 tons of freight, carried 25,500 passengers, evacuated around 9,200 patients, and transported some 6,200 troops. In the process it lost 4 planes and 1 glider and had 19 planes and 32 gliders damaged.

East, Ninth Air Force, and RAF Malta, showed the following grand totals:<sup>33</sup>

Sorties: 350,147 (USAAF, 150,202; RAF, 199,945)

Bomb tonnage: 113,870 (USAAF, 81,306; RAF, 32,564)

Enemy a/c claimed destroyed in combat: 4,626 (USAAF, 2,952; RAF, 1,674)

Enemy a/c claimed destroyed on ground: 2,731

Total enemy a/c claimed destroyed: 7,357

Enemy a/c claimed probably destroyed: 1,074; damaged, 2,690; found abandoned, 4,634

Allied a/c lost to enemy action: 2,246 (USAAF, 1,248; RAF, 998)

In contrast to the reduced operations of Strategic's planes in November, German long-range bombers, now well established in northern Italy and southern France, were more active than they had been since the beginning of the Italian campaign. The principal raids were against Naples, which with its satellites (notably Bagnoli and Torre Annunziata) currently was handling around 9,000 tons of shipping per day. The enemy attacked on the 1st, 5th, 10th, and 26th but did little damage, although he used as many, perhaps, as 110 planes. On the 10th a small night bomber effort against La Maddalena harbor in Sardinia accomplished nothing. But on the 11th about twenty bombers from southern France raided a convoy off Oran and, although Coastal's fighters drove off all of the Do-217's, the He-111's and Ju-88's sank four ships by use of torpedoes and the FX radio-controlled glide bombs which had been used successfully against shipping at Salerno.\*

This outburst of activity was stopped by the Fifteenth's attack on the Istres complex on the 16th and by ten days of bad weather. But the GAF renewed the offensive on the 24th with an unimportant raid on La Maddalena; and on the 26th more than thirty bombers heavily attacked a convoy off Bougie. One troop ship was sunk, but Coastal's fighters claimed 8/2/8 of the enemy's planes. The raid witnessed the first use in the Mediterranean of the enemy's He-177, a twin-engine monoplane with a wing span of over 103 feet. The GAF's activities for the month ended with two raids on shipping, one near Naples and the other off Bengasi, neither of which did appreciable damage.<sup>34</sup>

The sudden increase in the enemy's bomber operations, the number of different targets attacked, and the new habit of raiding more than one target on the same night indicated that the enemy had abandoned

\* NAAF countered the glide bombs by using long-range AA on the "parent" plane, short-range AA on the glide bombs, fighter umbrellas during daylight hours, and the usual passive defenses. Attempts to jam the radio frequency which controlled the FX bomb were as yet unsuccessful.

the "Pelz doctrine" of concentrating all available bombers on a single target at long intervals (which had governed GAF practice in the Mediterranean during recent months) in favor of simultaneous or closely succeeding attacks by smaller formations.<sup>35</sup> One might also have inferred that the enemy was preparing to launch a real air assault on the Allies, especially against ports and convoys.

As if to lend weight to this inference, the GAF carried out on the night of 2/3 December its most successful raid of the year, at Bari. Around thirty aircraft made the attack, coming in behind planes which dropped Window. Normally, a thirty-plane night attack by the Luftwaffe would have produced only limited damage, but this time the enemy enjoyed a freak success. His bombs hit two ammunition ships which blew up in the ship-crammed harbor; the resulting explosions and fires destroyed seventeen ships totaling 62,000 tons and carrying 38,000 tons of cargo (mostly hospital supplies and 10,000 tons of steel plank), caused many casualties, and so damaged the port facilities that Bari's capacity was not back to normal for three weeks. The success of the raid owed much to the enemy's good luck in hitting the ammunition ships and to his skillful use of Window; but the extraordinarily heavy damage occurred because the Allies had unwisely crowded their ships in the harbor. The weakness of fighter and AA defense reflected poor—and perhaps inadequate—communications, incomplete liaison among the several defensive elements, and insufficient guns and searchlights.<sup>36</sup>

The Bari raid caused renewed concern for the safety of Allied bases and installations in eastern Italy.<sup>37</sup> It indicated that the Germans were in a position to launch sudden and even heavy attacks anywhere in the central Mediterranean because of the large number of air bases which were available to them in Italy and the Balkans. This conclusion appeared to be confirmed on the night of 13/14 December when the GAF again visited Bari. Although the attacking planes did little damage, the raid was significant because the planes came from Greece—the first time that bombers from that area had attacked an Italian target. The Allies drew some comfort from the deduction that the attack had come from Greece probably because the enemy was withdrawing most of his long-range bombers from Italy to Germany. Subsequently, this was confirmed by photographic evidence. Captured GAF records revealed after VE-day that at the end of December the enemy's bomber force in the Mediterranean was down to 29 serviceable planes as against 214 on 30 November—which explains why the Luftwaffe, except for its two



raids on Bari, seldom bothered the Allies in December.<sup>38</sup> Intelligence credited the withdrawal to the GAF's difficulty in operating from fields in the Po Valley during winter fogs and to its reluctance to match its dwindling bomber force against NAAF's defensive fighters. The latter assumption seemed borne out when a similar withdrawal by long-range bombers from the eastern Mediterranean soon became evident.<sup>39</sup>

The GAF's offensive fighter and fighter-bomber effort in December was as variable as it had been in November, going up or down in terms of the weather and the extent of Allied ground activity. The maximum number of sorties for any one day was around 130, but with a daily average of not more than 50 there was no real threat to the Allied forces.<sup>40</sup>

The GAF did but little better defensively, although apparently it should have. By the end of November it had in northern Italy a well-established system of fighter defenses and good warning and interception systems. It had changed its tactics: instead of concentrating on Allied bombers, it now was going for the fighter escort alone whenever possible. These developments, however, did not seem to help the GAF, for its fighters continued to attack only in spots, and whether over Italy, the Balkans, or Greece, their efforts were not sufficient for the defense of the area.<sup>41</sup> The truth of the matter was that the deterioration of the fighter force, a decline which had become rapid in the Sicilian campaign, had continued apace since the Allied invasion of Italy; contributing factors were losses in the air, NAAF's attacks on airfields, and the GAF's lowering of the previous high priority which the Mediterranean had enjoyed on replacement fighter aircraft. The last-named factor is illustrated by the fact that Me-109's allotted to the Mediterranean totaled 220 in July but only about 100 in October. The enemy's fighter strength promised to recover somewhat as a result of his policy of conservation and because he was beginning to use many of the better Italian planes (notably the Macchi 205's). But it was felt that so long as NAAF kept up its counter-air offensive and thus forced the Germans to disperse their air forces to meet attacks from both England and Italy, the enemy's fighter situation would continue to deteriorate.<sup>42</sup>

As for the enemy's bombers, his unwillingness to press his attacks with determination, the poor standards of his crews, and the production priority held by fighters indicated that the GAF bomber force was not likely to be a major factor in future operations in the Mediterranean. The steadily growing weakness of the enemy's air arm, as well as his in-

creasing dependence on ground troops, was evidenced by the fact that at the end of November there were 26,806 German Air Force troops either fighting, or working, alongside army troops.<sup>43</sup>

### *December*

During December the Fifth and Eighth Armies, whose advance had been progressively slower since the beginning of October, made very little progress against the obstacles provided by terrain, weather, and a stubborn German defense.<sup>44</sup> Bad weather continued to limit the activities of the Allied air forces. The month opened with great promise, at any rate with respect to air operations.<sup>45</sup> On the 1st and 2d, NAAF'S planes flew more total sorties than on any two consecutive days since the middle of September. On the 2d, Tactical alone flew more than 1,200, all except 70 in coordination with the ground forces. Around 340 of the sorties were over the Eighth Army where fighters and fighter-bombers attacked enemy positions, guns, and vehicles all along the front (especially around Lanciano) and raided traffic in the rear of the enemy's lines. Another 70 sorties were flown over the Yugoslavian coast in fighter sweeps. The main part of the day's activities, however, was over the Fifth Army front, in a softening-up program for the full-scale ground attack which was to be launched during the night against the enemy's key stronghold at Mignano. From dawn to dusk medium, light, and fighter-bombers pounded gun positions around Mignano and southeast of Cassino. The 450 tons of bombs dropped by 260 bombers and 273 fighter-bombers thoroughly covered many targets and inflicted heavy damage. In addition, USAAF and RAF Spitfires flew more than 100 offensive and defensive patrols during the day. But 2 December proved to be Tactical's peak day of the month. Thereafter, weather and the status of ground operations never permitted the force to come close to its effort of that day. Throughout the month, however, TAF continued its program of bombing, strafing, and patrolling over the Italian front and in the enemy's rear and over the Yugoslavian coast.

From the 3d through the 7th weather forbade all but a few missions in support of the armies. In the west, operations were almost wholly against rails, roads, and bridges from the battle line to above Rome, although fifty-six B-25's got in a hard smash on the 7th against the port of Civitavecchia. In the eastern sector, USAAF and RAF fighter-bombers helped the Eighth to take Lanciano, penetrate Orsogna, and hold on at Guardiagrele. Better weather from the 8th through the 10th

allowed Tactical to fly a large number of sorties for the Eighth Army. Light and fighter-bombers strongly aided the New Zealanders as they battled for Orsogna and the Canadians as they crossed the Moro River below Ortona; and attacks on transport from Orsogna to the coast were so successful that on the 10th alone the destruction of 53 vehicles and the damaging of 125 were claimed. In the Fifth Army area, on the 8th and 9th, over 400 P-40 and A-36 sorties and 60 A-20 sorties were flown against communications, troop concentrations, gun positions, and bivouac areas. By the end of the 9th, Fifth Army had driven the enemy from practically the entire Monte Camino feature. For all the bad weather, the attacks of XII Air Support Command undoubtedly contributed to the general weakness of German artillery during the Allied advance.

On 10 December the weather disintegrated over the western sector, and on the 11th and 12th it was so bad all over the peninsula that only a few sorties were flown. By that time, Tactical's B-25's had added some 220 sorties to the air force total for the month in attacks on railways north of a line from Rome to the Adriatic, bombing Pescara, bridges at Giulianova, the junction at Terni, and the station at Aquila.

During the last three weeks of the month, the principal activities in western Italy were in cooperation with II Corps' slow and bitter drive against the enemy's strong positions on the high ground above Mignano and with VI Corps' equally difficult offensive east of Acquafondata. From the 13th through the 17th good weather over both battle fronts permitted more than 1,100 sorties by A-36's and P-40's, 215 by A-20's, and 24 by B-25's, while USAAF and RAF Spitfires averaged over 100 patrol sorties per day. Fighter-bomber sorties were all by AAF units; most of them were against lines of communication entering the Cassino sector (including the reinforcement port of Civitavecchia); the remainder were against guns and troops in order to reduce resistance to the Fifth's push toward the Cassino line in the San Vittore (II Corps) and Acquafondata (VI Corps) areas. The U.S. A-20's divided their effort between the enemy's base at Frosinone and gun positions along the front. A small B-25 effort was directed against bridges around Pontecorvo.

From the 18th through the 31st, flying and bombing conditions were so unfavorable that normal tactical operations were possible over the Fifth Army only on three days and over the Eighth Army only on five. To rain and clouds was added a strong crosswind, especially in eastern

Italy, which frequently made operations impossible. During the two-week period only about 1,000 fighter-bomber sorties were flown on behalf of the Fifth Army, most of them against positions and guns around Cervaro, supply routes, dumps, and bases in the Sora-Arce and Arguani-Frosinone areas, roads, bridges, and bases around Cassino, Santa Elia, and Atina, and the ever-popular docks and yards at Civitavecchia. About 180 A-20 sorties were flown, the targets being generally in the same zones covered by the fighter-bombers. B-25's made a few attacks on road bridges northwest of Aquino and hit a base at Terracina. Coastal Air Force complemented Tactical's operations by strikes on shipping and raids on ports, rail lines, transport, and installations along the Tyrrhenian coast. The missions were flown by planes of the 63d Wing, currently based on Corsica.

Enemy planes were encountered in strength only on the 14th, 15th, and 19th, and on these days the Allies claimed thirteen planes while losing six. Claims of XII ASC against vehicles totaled 54 destroyed and 91 damaged; against rail movement, 59 engines and cars destroyed and 111 damaged; against vessels, 3 sunk and 15 damaged.

In eastern Italy air activity was only slightly greater than in the west. Desert Air Force flew most of its sorties in cooperation with the Eighth Army's drives in the Ortona and Orsogna areas; the remainder were across the Adriatic. Particularly important days were the 13th, 16th, 18th, 22d, 30th, and 31st. On the last two days unusually good weather allowed Tactical's planes to fly almost 550 fighter-bomber sorties against infantry positions and artillery concentrations along the entire coastal sector with excellent results. There were few encounters with the Luftwaffe. Perhaps it was just as well, for DAF lost 44 planes to enemy aircraft, flak, and ground fire, while claiming only 22 enemy planes destroyed, 4 probables, and 16 damaged. Its record against transport was as good as usual, however: 51 road vehicles destroyed and 335 damaged; 20 locomotives and cars destroyed and 104 damaged; and 7 vessels sunk and 22 damaged.

Many of DAF's claims were registered in the course of attacks on Yugoslavian airfields, the Dalmatian ports of Split, Sibenik, and Zara, and rail and road lines which supplied the enemy for his operations against Tito's Partisans. In all, Tactical flew 346 fighter-bomber and 327 medium bomber sorties against Balkan targets, but many of them were rendered ineffective by weather. Coastal also was active across the Adriatic, its RAF 242 Group, which had moved to eastern Italy in

October, attacking ports, railways, transports, shipping, and military installations. For the month, NAAF's operations over Yugoslavia were much greater than they had been in any like period.

In December—as in November—the weather interfered more frequently with Strategic's operations than with those of Tactical. Strategic ended December with only a slightly higher total of effort than it had recorded for the previous month. A majority of its squadrons had completed their moves from Tunisia to the mainland or the islands by the middle of December, and by the end of the month all of the units had been moved, but some were not able to operate until January or February because of poor conditions at their fields.<sup>46</sup>

Targets fell into the same general pattern as in November: rail lines and yards, aircraft production and other industries, counter-air force and miscellaneous targets. However, because of bad weather there was an increase in operations against rail lines and yards at the expense of the Combined Bomber Offensive. The program against lines of communication again was shifted to marshalling yards, which took twice as heavy a pounding as did bridges and lines.

Two days of extensive attacks opened the month. On the 1st, seventy B-26's bombed bridges on the Genoa-Rome line. That night Wellingtons hit the Pontassieve yards east of Florence, damaging the station and industrial sheds but missing the 700-foot railway bridge. The big mission of the day was against the Fiat ball-bearing works at Turin, which now was considered to be more important than ever to the Germans as a result of the Eighth Air Force's hard blow against Schweinfurt on 14 October. The 118 B-17's, with P-38 escort, which reached the target unloaded 354 tons of bombs. Damage to the works, near-by industrial buildings, and yards and rail lines was severe.

On the 2d the Bolzano and Arezzo yards and the bridge ten miles south of Orvieto were bombed with good results. The day's major operation was carried out by 118 B-17's against U-boat pens which were under construction at Marseille. Workshops, railway tracks, and rolling stock were hit hard, the entire target area being covered. The P-38 escort scrapped with twelve to fifteen enemy planes, claiming two, and the B-17's took on another fifteen or twenty and claimed 9/4/2.

In the next ten days the weather was so bad that the Italian railway system suffered fewer attacks than in any comparable period since 1 September. The hardest blow was Tactical's B-25 attack against rail-

ways along a line from Rome to Pescara, as noted above. Strategic's efforts were limited to missions by B-26's against the Spoleto viaduct, the Orte yards, and the Ventimiglia bridges. The only important attack by heavies on communications was a raid by thirty-one B-24's on the Sofia yards. Around thirty enemy planes which attempted to intercept the formation took a licking, eleven being shot down to the loss of two P-38's. Five missions were flown against airfields, but only one of the fields, Guidonia, was in Italy. The other four missions were against three fields in Greece, where the enemy's air force, having helped to knock the British out of the Aegean, now constituted a threat to Allied shipping in the eastern Mediterranean. Eleusis, Kalamaki, and Tatoi, all near Athens, were the targets and all three were well covered.

During the last half of December, Strategic intensified its offensive against rail lines; in fact, almost the entire effort of the Fifteenth was against such targets. Despite bad weather which canceled many missions and rendered others abortive, heavies flew 812 effective sorties and B-26's carried out 737; together they dropped 3,206 tons of bombs. The main targets were on the Brenner Pass route, the Tarvisio route (through northeastern Italy to Villach, Austria, and southern Germany), and the west-coast and east-coast lines. The heavies went generally for the more northerly targets and the mediums for those in central Italy and up the west coast.

On the Brenner Pass route the yards at Innsbruck and Bolzano and the viaduct over the Avisio River between Trento and Bolzano were bombed with a total of 450 tons. On the Tarvisio route the Padua yards and the bridge and tunnels at Dogna (northeast of Venice) were hit with 430 tons. Traffic along both routes was sharply curtailed. The offensive against the west-coast line was heavy; it included attacks on five yards, three viaducts, two bridges, and the Civitavecchia harbor and yards. Disruption to the lines was considerable, especially at Civitavecchia where the combined attacks of Strategic and Tactical completely isolated the town. The interdiction of the Pisa-Rome route was complemented by assaults on bypass lines in the central and west-central part of the peninsula. The heaviest blows were against the yards at Poggibonsi, Foligno, Perugia, Castiglione, Prato, Empoli, Pistoia, and Borgo San Lorenzo and against the railroad bridges at Orvieto and Certaldo. In all, some 550 tons of bombs were expended against the west-coast line and more than 600 tons against bypass lines.

The most successful of the antirailway operations, however, was



against the east-coast route. The Rimini and Ferrara yards, together with bridges and tracks in the vicinity, and the railway and canal junction at Ravenna were pounded by heavies with around 750 tons; B-26's of TAF added 98 tons in attacks on the Falconara yards. The disruption of traffic was more nearly complete than on any of the other Italian lines.

As a result of the November and December attacks there was a heavy reduction in Italian rail traffic; personnel and equipment were delayed in reaching the front, and much time and effort were lost by the enemy in effecting repairs and in transshipping.<sup>47</sup> However, the interdiction was far from complete, and the Mediterranean Allied Air Forces (which in December replaced NAAF and MAC)\* noted that "a comparison of rail capacities with enemy military requirements emphasizes the need for *complete, simultaneous* and *continuous* interdiction of rail traffic supplying the enemy forces in central Italy."<sup>48</sup> Looking into the future, MAAF recommended that the Spezia-Rimini line be attacked immediately and that the long-range program include the lines Genoa-Spezia, Aulla-Parma, Bologna-Pistoia, Bologna-Prato, Faenza-San Lorenzo, and Rimini-Ancona.<sup>49</sup>

After its attacks on lines of supply, Strategic's principal operations during the last two weeks of the year were against the enemy's air force, but the effort was a small one. The only attack on aircraft production came on the 19th when the Messerschmitt plant at Augsburg, site of research and experiment and final point of assembly for the Me-110, was hit by fifty B-24's which dropped eighty-six tons through 10/10 clouds. The mission met tough opposition from between fifty and sixty enemy fighters; of these, thirteen were shot down and eight probably destroyed at a cost of three bombers shot down and one missing.

Strategic flew missions against airfields only on two days. On the 14th, 126 B-17's and B-24's seriously damaged airfields in Greece. On the 25th the fields at Vicenza and Pontedera took limited attacks as secondary targets. Tactical aided the counter-air force offensive with a moderate blow against Mostar in Yugoslavia and a very heavy attack on the two Ciampino fields near Rome. Against the latter, B-25's dropped 52 x 250 pounds of high explosives and 3,743 x 20 pounds of frags, causing extensive damage to administrative buildings, hangars,

\* See below, pp. 744-47.

workshops, and aircraft on the ground; thirty-six A-36's added to the damage in a follow-up sweep which destroyed six planes on the ground.

The Allied air effort for the month was greater than it had been in November.<sup>50</sup> More than 27,500 effective sorties were flown, and 10,500 tons of bombs dropped.\* In types of targets bombed the picture was very different in December from what it had been in November when gun positions and concentrations had headed the list, followed (in order) by railways, yards, airfields, industrial establishments, and port facilities, with no one of the types receiving an outstanding percentage of the bombs dropped. In December, on the contrary, marshalling yards were far ahead of all other targets, taking some thirty per cent of the total. The yards were followed by gun positions and camps, rail lines, airfields, port facilities, and highways. A more static battle line and an increase in Strategic's operations accounted for the changes in emphasis.

Unquestionably, the enemy's combined air and ground defenses against Allied planes were more effective than they had been in November and, in some respects, more effective than at any time since the beginning of the Italian campaign. Not only were Allied plane losses greater but the percentage of combat crewmen killed, wounded, and missing in action per 1,000 sorties was higher than it had been in November and generally above the average for the period from 1 September to 31 December.<sup>51</sup> And, lest the casualty rate for the air arm be minimized, it should be noted that from D-day of AVALANCHE to the end of November the ground forces' casualty rate (killed,

\* The USAAF flew 62 per cent of the more than 27,500 sorties. Tactical flew around 15,000 sorties, Coastal 7,500, Strategic 4,500, and PRW 530. In Strategic's operations lay the greatest difference between the operations of the USAAF and the RAF, for the latter's Wellingtons flew fewer than 100 sorties while the USAAF's heavies and mediums recorded close to 2,700 and its escort fighters around 1,700. As usual, the RAF predominated in Coastal's operations, but American elements accounted for 40 per cent of the total sorties as against 32 per cent in November. The 10,500 tons of bombs dropped represented an increase of 2,000 tons over November; the USAAF dropped 93 per cent of the total. Strategic pushed Tactical out of first place. The greatest increase in activity was by the B-26's, which flew almost three times as many sorties and dropped nearly twice as many bombs as in November. In the matter of victories and losses the Allied record for the month showed an increase in both departments. Claims totaled 259/53/65, not including some 25 planes destroyed on the ground; the USAAF accounted for 86 per cent of the victories. Losses came to 209, of which the USAAF lost 61 per cent. The Allies also had 544 planes damaged, 85 per cent of them USAAF. Most of the damaged aircraft were victims of flak and ground fire.

+	Month	B-17	B-24	B-25	A-20	P-38
	November	6.15	18.68	3.02	3.06	8.63
	December	7.57	22.90	3.19	3.30	10.10
	1 Sept.-31 Dec. avg.	5.78	19.08	3.37	2.94	10.02

wounded, missing in action; combat and non-combat) averaged 6.33 per month per 1,000 men, whereas the air forces' rate was 7.69.<sup>52</sup>

Despite evidences of enemy strength and the limited number of attacks against the GAF accomplished during November and December, it was the feeling at MAAF at the end of the year that the German fighter industry was "staggering" from the blows which it had received. But MAAF also felt that the counter-air offensive had reached a critical stage and unless the earlier attacks were followed up with further blows the substantial results achieved thus far would be considerably dissipated. It would be necessary to reattack Regensburg and Wiener Neustadt, to destroy the Erla plant at Leipzig, and to smash a small number of specialized component plants in Poland, southern Germany, and southeastern Europe. The program appeared to the theater air leaders to be well within the capabilities of Allied air power.<sup>53</sup> General Arnold at AAF Headquarters in a "year's-end" message to the Fifteenth emphasized especially the urgency of the counter-air program and his concern over previous diversions from the main task.<sup>54</sup> Assurances were given that the means for its accomplishment would be made available.<sup>55</sup> At the same time he sought advance information on planned operations and periodic notification of proposed changes in the hope of effecting a better coordination of effort among all participants in the Combined Bomber Offensive.<sup>56</sup>

If the emphasis in plans for 1944 thus tended to fall upon Strategic's role in the CBO, it was at the same time evident that much work remained to be done in the areas of tactical cooperation with ground and sea forces in which for so long now the Mediterranean had been the proving ground. To carry out its varied tasks Allied air forces had some 315,000 personnel and 7,000 effective aircraft in the theater.<sup>57</sup> Most of the men and planes were American or British, but the French had been playing an active part in combat since the beginning of the Italian campaign and Italian units had begun to operate under NAAF on a small scale late in October.<sup>58</sup> Still more recently, four ten-men crews of Yugoslavians, trained in the United States to fly B-24's, had joined the 376th Bombardment Group.<sup>59</sup> With its units based largely by the end of December in Italy, Sicily, Sardinia, and Corsica, rather than North Africa, MAAF enjoyed new advantages of position. The reorganization under MAAF, well on the way to completion by the end of December,\* promised additional strength for the tasks which lay ahead.

\* See below, pp. 747-50.

## SECTION IV

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*TOWARD OVERLORD*



## CHAPTER 18

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### *AIR LOGISTICS IN THE ETO*

THE indorsement of the CBO Plan by the Combined Chiefs of Staff and the decision of the TRIDENT conference at Washington in May 1943 to mount an invasion of western Europe in the spring of 1944 posed for the Eighth Air Force and its service command an immense logistical problem. That problem was simple enough to formulate: to support adequately and continuously the ever expanding operations of the Combined Bomber Offensive while building up the air forces that would be required in support of the scheduled invasion. But to translate that mission into terms of effective action imposed upon AAF leaders one of the more difficult assignments of the entire war. Of assistance was the fact that from the very first the Eighth Air Force had faced in some degree a dual obligation to prepare itself for both strategic and tactical operations. In the spring of 1943 the task imposed a heavier burden because through the intervening months uncertainties of basic strategy, the imperious demands of TORCH, and the critical shortage of shipping had left the Eighth Air Force undermanned, underequipped, and in some ways organizationally underdeveloped. It is pertinent, therefore, to look first into the experience of that air force through the months which had followed its original establishment in the United Kingdom.\*

From June to September 1942 the growth of the Eighth had been rapid, but after doubling in numbers during August (from 15,000 to 30,000 officers and men) its strength had declined to a low of less than 23,000 by the end of November.<sup>1</sup> These figures reflect, of course, the

\* For a discussion of the establishment of the Eighth Air Force in the United Kingdom, see Vol. I, 612-54.



influence of TORCH. Beginning in September, the Eighth had transferred more and more of its men and units to the Twelfth, until in the end it was estimated that no less than 27,000 officers and men had been transferred to the younger air force.<sup>2</sup>

The months immediately preceding and following the North African landings had been a period of hectic and confused activity for the personnel accountants of the Eighth Air Force. Almost daily shuffling and reshuffling of individuals and units between the two air forces caused great difficulty. Some units originally intended for the Twelfth were in the end permanently assigned to the Eighth, their place in General Doolittle's Twelfth Air Force being taken by some of the more experienced and better-trained organizations in the older air force. In general, the Eighth had relinquished the most experienced units and much of its most skilled staff and operational personnel.<sup>3</sup> The replacements received, altogether aside from the question of numbers, for some time to come could not hope to fill the gaps created by departures for North Africa. Nor did the losses of the Eighth Air Force end with the original transfers to the Twelfth, for during the six months which followed the North African landings the Eighth served as a replacement pool from which TORCH drew men, units, and equipment as needed. Under these circumstances, statistics regarding AAF strength in the United Kingdom can be regarded as no more than approximate.

By the end of January 1943 the reassignment of Twelfth Air Force units still in England and the arrival of replacements from the United States had brought the strength of the Eighth Air Force up to 36,000 officers and men.<sup>4</sup> But not until the spring of 1943 was the build-up of the Eighth seriously resumed. The more immediate and pressing demands of the North African campaign continued to hold the higher priority for both shipping and trained units until the victory in Tunisia and the decisions reached at the TRIDENT conference in May gave to the Eighth the priorities required for the execution of its share in the combined offensive.<sup>5</sup>

In June 1943, with units of all types flowing into the theater, the strength of the Eighth Air Force mounted steadily toward the 100,000 mark and, indeed, passed it by the end of the month.<sup>6</sup> At that time more than half of all U.S. Army forces in the European theater belonged to the Eighth, which for some time yet would enjoy a higher priority than either Army ground or service forces in the build-up preparatory to the continental invasion.<sup>7</sup> Having increased the effective strength of its

three heavy bombardment wings\* from six to twelve groups in May, the Eighth Air Force had a total of seventeen operational combat groups of all types by the end of June and an assigned combat strength of twenty-six groups in the United Kingdom, on detached service in North Africa, or en route from the United States.<sup>8</sup> In addition, there were nineteen service groups and seven of the badly needed air depot groups.<sup>9</sup>

The bomber command, from a low of barely 10,000 officers and men at the end of November 1942, had grown by the close of June 1943 to more than 40,000, a figure which represented approximately 40 per cent of the current strength of the Eighth Air Force. Almost two-thirds of this growth had taken place in the preceding two months.<sup>10</sup> Second in size to the bomber command was the service command. Numbering on 30 November 1942 little more than 8,000 men, it had doubled its strength by the end of the following June, but its approximately 16,000 personnel at that time represented less than one-sixth of the Eighth's total strength.<sup>11</sup> This disparity between combat and service personnel contributed to the supply and maintenance difficulties experienced throughout the early history of the Eighth Air Force. The fighter command, having shrunk after the North African invasion to one fighter group and a strength of no more than 2,000 men, had continued with only one operational group until April. The air support command, left practically with no mission to perform by the decision to postpone indefinitely an invasion of western Europe, had been denuded of all its bombardment and troop carrier units and all its personnel except for barely 500 officers and men. When, in the spring of 1943, fighter and medium bombardment units flowed once more to the United Kingdom, both fighter and air support commands began a steady growth. By the end of June each had a strength in excess of 10,000 officers and men.<sup>12</sup>

The 12th Replacement Control Depot, which since September 1942 had been operating stations at Stone and Chorley for receiving, processing, and assigning all casual air force personnel who arrived in the theater, had handled fewer than 1,800 persons during 1942. But in the first six months of 1943, nearly 5,600 casualties passed through the replacement depots, almost two-thirds of them in June.<sup>13</sup> In March the depots were given responsibility also for the reception of replacement combat crews, of which there would be few until summer. The 14th

\* The Eighth had also one medium bombardment wing.

Replacement Control Depot arrived in April to be stationed at Chorley and under the jurisdiction of the 12th, whose station at Stone continued to act as headquarters for the replacement depot organization. A shortage of qualified permanent personnel to staff these depots contributed to serious difficulties initially experienced in handling the troop flow, but a beginning had been made toward providing the machinery for channeling the floods of casualties who would be fed into the Eighth Air Force over the ensuing years.<sup>14</sup>

Heaviest responsibility for the diverse problems inherent in the rapid build-up to which the Eighth Air Force could now look forward fell upon the VIII Air Force Service Command (commanded by Maj. Gen. Walter H. Frank until November 1942 and afterward by Maj. Gen. Henry J. F. Miller) and the Services of Supply, European Theater of Operations (Maj. Gen. John C. H. Lee). In accordance with an arrangement of 1942, problems of construction, debarkation, priority for shipping, and supply of items common to both ground and air forces were left to the control of SOS, but under its over-all control the VIII Air Force Service Command enjoyed a large degree of autonomy with reference to supply and maintenance peculiar to the air force. In an attempt to smooth out some of the difficulties naturally arising from the semiautonomous position thus conceded to the service command and from its natural tendency thereafter to seek an enlargement of its autonomy, an air force division had been established at SOS headquarters in the fall of 1942.<sup>15</sup>

At all echelons, and especially in the handling of logistical problems, there existed a need for close collaboration with corresponding British agencies. Accordingly, the Eighth Air Force and the Air Ministry exchanged liaison officers, and General Eaker in December 1942 even had appointed as a deputy chief of staff Air Cdre. A. C. H. Sharpe of the RAF, who thus held a unique distinction for a non-American. The service command in turn exchanged liaison officers with British service agencies which included the Ministry of Aircraft Production and the RAF Maintenance Command. Similarly, at each combat base and depot of the Eighth the RAF had stationed liaison and equipment officers with appropriate staffs.<sup>16</sup>

The very concept of the air service command was in 1942 a new one for the AAF. Its Air Service Command in the United States had been established as recently as October 1941 and AAF Regulation No. 65-1, which prescribed the organization and functions of a typical air service

command, had not been issued until August 1942. This regulation assigned to the air service command of an overseas air force the responsibility for echelons of supply and maintenance beyond the capacities of combat units.\* For the fulfilment of this function the command would depend chiefly upon service and air depot groups. The service group normally would maintain a service center to provide third-echelon maintenance for two combat groups operating from dispersed squadron airdromes. Located perhaps as much as four hours' truck-transport distance to the rear of the advanced airdromes, this center might service as many as six or eight squadrons on a comparable number of airdromes. Still farther to the rear, an air depot group would operate an air depot providing fourth-echelon services of supply and maintenance for two service centers.<sup>17</sup>

From the very beginning of operations in the United Kingdom the Eighth Air Force deviated from the organization prescribed in AAF Regulation No. 65-1. As early as July 1942, General Spaatz had ruled that service groups and their third-echelon functions would be assigned to the combat commands—bomber, fighter, and air support—rather than to the service command.<sup>18</sup> Within the next few months it was also decided to do without the service centers. The limited geographical area available for the use of the Eighth Air Force, not to mention the equally limited supply of labor and material, argued for a reduction in the number of separate installations. Consequently, it was decided to build larger airdromes capable of holding a full combat group instead of one or two squadrons and to place the service groups on the combat airdromes. For the sake of operational efficiency it was further decided, against the wishes of the service command, that base commanders must control all units located on the base.<sup>19</sup> Thus, the service command was left chiefly with the function of fourth-echelon supply and maintenance, its chief unit instrument being the air depot group. It was understood that the command would perform all such service functions as lay beyond the capacities of the combat base, but the base had been made much more nearly self-sufficient.<sup>20</sup>

\* First-echelon maintenance includes repair and service that can be provided by the crew of the plane; second-echelon is that provided by the ground crew forming a part of the combat unit; third-echelon maintenance is normally provided by more or less mobile organizations possessed of heavier equipment than that of a combat unit; fourth-echelon covers general overhaul and reclamation involving the use of heavy equipment in more or less fixed installations. The terms have a parallel meaning in the distribution of supplies.

The organization of this new type of combat base had reached a stable pattern by June 1943. The core unit of the base, of course, was the combat group, comprising either three or four squadrons and varying in size from the 900 men of a fighter group to the 1,600 men of a heavy bombardment group. As a logical result of the abandonment of the service centers, service groups had been split into two equal parts for assignment to separate airdromes. Service units on a combat base usually included an ordnance company and quartermaster, signal, chemical, and military police detachments in addition to a service squadron and a detachment of the service group headquarters and headquarters squadron. A few miscellaneous detachments—weather, finance, gas defense, and infantry—were often stationed on the base also. The total strength of these service units averaged about 500 men, so that the average strength of a fighter base was about 1,400 or 1,500 and that of a bomber base over 2,000.\* Combat squadrons performed their own first- and second-echelon supply and maintenance, while in theory the service units concentrated on third-echelon service. But in actual practice these distinctions often had little meaning, and all hands cooperated to get done the work that had to be done.<sup>21</sup>

Fourth-echelon supply and maintenance depended largely on the air depot at Burtonwood—between Liverpool and Manchester—which was operated jointly with the Ministry of Aircraft Production. Even Burtonwood, however, was still in an early stage of development and its greatest expansion would not begin until the summer of 1943. Langford Lodge, on the other hand, was in full operation by June 1943, but its location in Northern Ireland limited its usefulness to the combat groups. Warton, the third base depot, was still under construction and would be of little value until late in 1943.

Since Burtonwood alone could not meet all needs and was somewhat removed from the combat bases, the service command in 1942 had undertaken to establish an advanced depot in each of the bombardment wing areas. The depot at Honington, which originally had been established in September, was formally activated in November to serve all bombardment groups for the time being. Little Staughton, one of the original airdromes of the 1st Bombardment Wing, had been selected as the site of the depot for that wing; pending the completion of necessary

\* By the middle of 1944, as a result of the increased number of combat crews assigned and larger service units, most of the fighter bases had more than 1,600 men and the bomber bases more than 2,500.

construction, the combat base at Thurleigh was utilized as an advanced supply depot for the 1st Bombardment Wing. Development of facilities for a depot at Watton still lagged in June 1943, but plans at that time called for the activation of a total of at least six and possibly more advanced depots—one for each of the four bombardment wings, and one each for the fighter and air support commands. For the supervision of the advanced depots the service command in February 1943 had established a new headquarters, the Advanced Air Service at Milton Ernest, some fifty miles north of London and a few miles above Bedford. By June the new headquarters had under its direction the operation of three depots (at Little Staughton, Honington, and Wattisham) and was directing the preparation of three additional depots: Watton, for the 2d Bombardment Wing; Stansted, for the 4th Bombardment Wing; and Greenham Common, for the air support command.<sup>22</sup> The service command retained direct control over the development of the larger base air depots at Burtonwood, Warton, and Langford Lodge.

The headquarters organization of VIII Air Force Service Command, like its over-all structure, responded to the pressure of problems demanding a more functional staff arrangement than the conventional Army staff. Revisions in staff organization had first minimized and finally, in June 1943, done away with the traditional Army staff structure.\* Two additional divisions—the supply division and the maintenance and repair division—had been set up in September 1942, and over the intervening months they had absorbed so largely the functions of A-4 that the latter organization was dropped from the staff in June 1943.<sup>23</sup> The new divisions, together with the plans division, served as the main channels through which Headquarters, VIII Air Force Service Command (located at Bushy Park alongside the headquarters of the Eighth Air Force) exercised its diverse responsibilities. A more detailed discussion of these responsibilities falls naturally under the headings of installations, supply, and maintenance.

### *Installations*

The Eighth Air Force airdrome and depot construction program, undertaken by British authorities early in 1942, had made substantial progress despite the ever changing plans of the Americans for the ultimate size and composition of the Eighth Air Force. It had proved im-

\* The Army "G" staff—"A" staff in the autonomous-minded AAF—consisted of G-1, Personnel; G-2, Intelligence; G-3, Operations; G-4, Supply.



possible to get from Washington commitments on build-up that would remain firm for more than a few months at most. Nevertheless, a core of construction work had been carried steadily forward with enough flexibility of plan to permit future expansion or contraction of the program. Not until the fall of 1943 did it prove possible to proceed with plans for construction on a relatively firm basis.

Theater headquarters had vested in SOS the responsibility for all U.S. Army construction in the United Kingdom, but it was agreed that the Eighth Air Force would control the planning of air force construction subject to the approval of SOS. As a last resort, the Eighth could appeal to the theater commander to reverse SOS decisions. This arrangement would continue throughout the war despite protests from the Eighth that the complex machinery of control delayed construction.<sup>24</sup> General Lee's headquarters also controlled the aviation engineer battalions assigned to the construction of airdromes and other installations for the Eighth Air Force. To the complexities of the American organization were added certain others peculiar to the British agencies charged with responsibilities for construction work. It was necessary to deal with the War Office, the Air Ministry, and the Ministry of Aircraft Production in planning and developing installations for the Eighth.<sup>25</sup>

The basic agreements with British authorities had been reached in the summer and fall of 1942. It had been planned that VIII Bomber Command would ultimately take over from the RAF five areas of fifteen airdromes each in the East Anglian region. Since none of these fields was itself large enough to house one full American bombardment group, the planning initially proceeded on the assumption that each American group would occupy a parent field and one satellite airdrome. It soon became evident, however, that there would be greater economy in developing all airdromes to a capacity equal to the requirements of a full group, and at a conference in November 1942, Portal, Spaatz, and Eaker agreed upon such a policy. This conference also settled a long-standing question regarding the location of American fighter units. It had been the desire of the British to integrate U.S. units with their own fighter system, but the American commanders had been anxious to avoid any commitment for the defense of the British Isles in order that the planes might be used exclusively in support of bomber operations. It was accordingly agreed in November that the American fighters would be housed on bombardment airdromes in the bomber

command areas.<sup>26</sup> In January 1943, however, Eaker had reconsidered and then asked that his fighter groups occupy fighter airdromes. An anticipated shortage of bomber airdromes and the more elaborate communications facilities required for fighter operations dictated the decision.<sup>27</sup> The location of these fighter fields in the general area already assigned to the bomber command tended to convert that area into an American zone except for certain RAF units stationed there.

The chief engineer of SOS had subsequently set up, in consultation with the Eighth's own engineers, a double set of priorities: one in terms of the dates by which bases would be required for the accommodation of groups, the other to govern the order of construction for the various types of installations on each airdrome.<sup>28</sup> Aside from the ever present shortages of men, materials, and space, the chief problems of construction centered about the task of expanding the British airdromes to a capacity beyond that for which they were originally designed. Satellite airdromes, in particular, lacked sufficient technical and housing facilities. Construction had lagged, almost inevitably, but it did not prevent the use of airdromes on schedule. American and British personnel joined hands to rush the installation of communications facilities, always of the greatest importance to operations. Other work might be completed after the field had been occupied by the Americans. At the end of the fall in 1942, VIII Bomber Command had almost 2,000 of its men still in tents, and at least two of the occupied airdromes lacked hangars or storage facilities.<sup>29</sup>

Among the several commands of the Eighth Air Force, bomber command's needs continued to hold first priority. Its program of construction had been revised since November as a result of extended study and negotiation with interested British agencies. It was found possible to reduce the authorized number of airdromes from seventy-five to sixty-two, of which forty-nine were scheduled for immediate construction. Adjustment of the internal structure of the command to the existing RAF system of communications and other factors had led in the preceding summer to a plan for grouping of the several units and their airdromes under five bombardment wings. The number was reduced early in 1943 to four in accordance with a plan to put B-17 groups in the 1st and 4th Wing areas, B-24's in the 2d Wing, and B-26's in the 3d Wing. In each wing area one airdrome was to be set aside for use as an advanced depot of the air service command.<sup>30</sup> This airdrome, however, would be ultimately released for use by a combat unit

through fulfilment of plans to construct separate depot facilities immediately adjacent to the field.<sup>31</sup>

The typical bomber airdrome in the Eighth Air Force, as it took shape in the spring of 1943, was carefully blended into the countryside, with its major sites dispersed to guard against enemy air attack. These sites, each designed for the performance of a distinct category of duties, reflected the functional organization of the base. The technical site, adjacent to the runways, was the scene of the repair and supply services. Perhaps as much as a half-mile to a mile away was the headquarters site, from which came the administrative and operational direction of the base. The mess and recreational site, usually close to the living quarters, generally contained the mess halls, a large shower bathhouse, a PX, some quartermaster warehouses, and clubs for officers and enlisted men. The several housing sites, up to seven or eight in number, were also separated by distances ranging up to a mile or more. In all, it was estimated that technical personnel on many bases had to walk or ride bicycles (which came into great demand) an average of seven miles per day in order to get to and from the various places at which they worked, ate, and slept.<sup>32</sup> Most of the buildings were of the prefabricated type erected on a concrete foundation. In general, the Eighth's bomber bases were adequate for their purposes and compared favorably with many air bases in the United States.

The slow build-up of American fighter units in the United Kingdom made the demands of the fighter command much less urgent. An overall program of construction of 25 March 1943 assumed that there would be three fighter wings and called for fourteen fighter airdromes.<sup>33</sup> But after the TRIDENT conference of May 1943 and its decisions in favor of the CBO and OVERLORD, the Eighth Air Force anticipated an ultimate strength of five fighter wings with a total of twenty-five groups by July 1944.<sup>34</sup> Until the required fighter airdromes had been prepared in East Anglia some groups would occupy bomber airdromes.<sup>35</sup> The decisions at TRIDENT gave new life also to the air support command, but firm plans for meeting its needs depended upon further action on the organization of air support for the continental invasion, action not to be taken until the summer and fall.<sup>36</sup> In June 1943 the VIII Composite Command, originally established for purposes of operational training, was still marking time in Northern Ireland. Operational training for newly arrived units was handled in England—at Bovington and Cheddington by the bomber command and at At-

cham and High Ercall for fighter organizations. Three combat-crew replacement centers were scheduled for construction in Northern Ireland, but action awaited the impetus of more definite plans for the build-up of the Eighth Air Force.<sup>37</sup> Plans for handling incoming casual personnel envisioned no more than an expansion of the facilities at Stone and Chorley<sup>38</sup>—a decision which would prove to be a serious miscalculation of needs.

### *Supply*

The great bulk of supplies for the Eighth Air Force necessarily came from the United States, and there, as in the organization of American forces in the United Kingdom, the responsibility for air force supply was divided. As an indispensable prerogative of its newly acquired autonomy, the AAF had secured authority to procure, stock, and distribute supplies and equipment peculiar to the Air Corps—aircraft and almost all items pertaining thereto, chiefly parts, spares, tools, and special equipment. For this purpose the AAF Air Service Command at Patterson Field, Ohio, acted as the principal agency. The Army Service Forces\* retained responsibility for all other supplies, especially for items common to both the AAF and the rest of the Army. Included in this category of "common user items," as a characteristic barbarism of the Army put it, were food, clothing, bombs and other ammunition, automotive vehicles, many items of signal equipment, and medical, chemical, and engineer supplies.

The United Kingdom served as a secondary but indispensable source of supply for the Eighth Air Force, and this was especially true in 1942 and 1943 when as yet the problem of shipping remained acute. Channels of supply between the Eighth Air Force and a variety of British agencies had been well established by the end of 1942. The Eighth procured supplies from the British through three channels: requisition on the RAF Master Provisioning Office at Stafford by the VIII Air Force Service Command, direct requisition on RAF sources by the RAF equipment liaison officers stationed at individual American installations, and by direct procurement.<sup>39</sup> The Services of Supply initiated direct procurement in the summer of 1942, tapping directly the resources of local industry through appropriate British government agencies, with the British government assuming responsibility for payment

\* The War Department's Services of Supply became the Army Service Forces in March 1943, but in ETO the theater service organization continued to be known as the SOS until May 1944.

under reverse lend-lease. The Eighth on its own initiative had already undertaken direct procurement through the Air Ministry, and when the Air Ministry supported the Eighth's request that it be permitted to handle procurement to meet its own requirements, the SOS agreed.<sup>40</sup>

British assistance was varied and extensive. In addition to building the great majority of all American air installations, the British provided the initial housekeeping equipment and supplies for them and replenished such supplies throughout the war. The RAF also supplied much of the Americans' rations during 1942, although by the end of the year nearly all of the Eighth was eating American rations. The British arranged for station services such as shoe repair and laundry and made available to the American air installations much signal, ordnance, medical, and engineer equipment and supplies.<sup>41</sup> Especially helpful was the assistance rendered in the field of Air Corps technical supply. Through the first year of the Eighth's existence in the United Kingdom, this assistance extended all the way from the provision of hand tools to the provision of combat aircraft. In accordance with over-all agreements for the allocation of aircraft between the RAF and the AAF, the Eighth acquired hundreds of Spitfires and other British aircraft. As late as April 1943 its oldest fighter group was still equipped with Spitfires.<sup>42</sup> The numbers received fell far short of the thousands of American-built aircraft made available to the RAF under lend-lease, but the planes were handed over cheerfully by an organization which could have used them for its own operations. By agreement the RAF and the Eighth pooled spare parts for planes used by both air forces.<sup>43</sup>

Perhaps of even greater aid to the performance of Eighth Air Force operations in 1942 and 1943 were the communications equipment and supplies provided, for in this field the British were further advanced than were the Americans.<sup>44</sup> Mobile VHF/DF radio equipment, VHF dynamotors, and aircraft radar equipment were obtained chiefly from the British, partly because they were not forthcoming from the United States and partly because it was necessary to use much British equipment in order to fit into the RAF communications system. The British also made available many common items of signal equipment and supply which could not be procured from other sources. For medical and chemical supplies and equipment the Eighth was also heavily dependent on RAF sources through 1943.<sup>45</sup>

Some of the Americans were naturally impatient to achieve independence of British assistance in adherence to the "Pershing Principle"

of the national integrity of forces.<sup>46</sup> But in April 1943 it was still possible for Col. Myron R. Wood, chief of the Supply Division of the service command, to report that the Eighth Air Force had received greater benefit from British services than it had been able to render in return. "Were not the resources of the United Kingdom at our disposal," he declared, "a more critical situation would most certainly have arisen through lack of spare parts and supplies."<sup>47</sup> And this was true despite the responsibility, optimistically assumed by the Americans in 1942, for the supply of spares for all American-built aircraft used by both the Eighth and the RAF in the United Kingdom.\*

The shortage of shipping available for the needs of the United Kingdom plus unanticipated operational needs led to additional demands on British sources of supply. The frequent failure of the Americans to plan sufficiently far in advance for requisitions on an industrial system functioning within the limits imposed by severe shortages made it difficult at times for the British to meet American demands. But eloquent testimony to the extent of the aid rendered is provided by the following breakdown of the estimated percentages of American- and British-procured supplies for all U.S. Army forces in the United Kingdom during the period 1 June 1942-31 July 1943:<sup>48</sup>

	<i>United Kingdom</i>	<i>United States</i>
Air Force	49%	51%
Quartermaster	53	47
Engineer	53	47
Ordnance	8	92
Medical	75	25
Signal	19	81
CWS	64	36
Transportation	12	88

The American supply services further estimated that of the 5,576,000 measurement tons of supplies received by the American forces in the United Kingdom, 1,919,000 tons, or 34 per cent, had been procured locally.<sup>49</sup> The VIII Air Force Service Command estimated that by the end of 1943 it had procured for the Eighth Air Force 422,271 ship tons of supplies from British sources. If to this figure is added the tonnage represented by the materials used in the construction and equipment of air bases and depots, the total would amount to 1,050,000 ship tons, or the equivalent of 175 vessels.<sup>50</sup> Virtually all local purchases

\* Not until 1 January 1944 was this responsibility actively assumed by the AAF in the European theater.



were paid for by the British government, which was anxious to avoid the inflationary effects that might have resulted from direct American payment.<sup>51</sup>

Even with generous assistance from the British, the provision of an adequate and steady flow of supplies and equipment from the United States presented a most complex problem. At the beginning of the war the War Department had based its plans for overseas supply on the principle that supplies should be automatically forwarded from the United States and replenished at regular intervals in accordance with a purpose to maintain a desirable supply level in each of the theaters. Theoretically, this approach was sound enough, but it soon required modification under conditions of actual warfare. Automatic supply tables for the flow of aircraft, spare parts, and other Air Corps supplies became quickly outmoded in 1942, for they were the product chiefly of peacetime experience and planning. Actual needs of both combat and service units were found to be far greater than had been anticipated and often different in nature, for the units themselves were being expanded and reorganized in accordance with the lessons of experience. Automatic supply as originally conceived produced huge surpluses of little-needed items and serious shortages of critically needed items. It resulted in a waste of valuable shipping space in 1942 and early 1943 and led to a demand for realistic revision of the plan.<sup>52</sup>

In the search for an answer to the problem, VIII Air Force Service Command undertook detailed studies of automatic supply and consumption rates. Its officers conferred in England with representatives of the AAF's Air Service Command and delegates attended a general conference on overseas supply held in April 1943 at Patterson Field. The conference resulted in drastic revision of current supply tables; adjustments were made both as to item and quantity. Moreover, the items included in the tables were to be packaged in the United States in the specified quantities.<sup>53</sup> Use of these "automatic supply pack-ups," initiated in the middle of 1943, proved helpful, but methods of supply from the United States continued to be a subject of concern.<sup>54</sup> From the first, automatic supply was supplemented by special requisitions from the VIII Air Force Service Command on the Air Service Command at Patterson Field. The vast bulk of supplies came, however, through normal channels by use of routine requisitions for six-month periods based on actual consumption records and correlated with automatic supply tables.<sup>55</sup>

It soon became evident that the effective functioning of any system of supply depended greatly upon the maintenance of accurate control records. With no less than 500,000 different items of Air Corps supply to be stocked at the base depots in England, it was necessary at all times to be in position to determine with speed and accuracy the inventories on hand. The field service section of the service command's supply division, to which had been intrusted the task of maintaining a master stock record, soon found itself handicapped by inadequate and inexperienced personnel and by an outmoded system of posting data by hand on tens of thousands of stock record cards. As both supply and consumption mounted rapidly during 1943, the record fell behind and became a less accurate guide to stock levels.<sup>56</sup> But not until 1944 would the solution be found through the installation of an automatic machine-controlled recording system.

Within the theater, the organization originally conceived proved to be well suited to the distribution of items of Air Corps supply. The combat base sent requisitions to the advanced depot, which, in turn, received its stocks from the base depot at Burtonwood, chief repository for Eighth Air Force supplies and equipment in the theater.<sup>57</sup> Channels for the supply of items of common use, all of which fell under the control of the Services of Supply rather than the service command, were different. Since at first neither the base nor the advanced depots stocked common supply items, the combat bases submitted requisitions for these items directly to VIII Air Force Service Command headquarters, which in turn made requisitions on SOS. By February 1943 it had been recognized that a considerable saving in time and effort could be effected by permitting the advanced depots to stock common items, and thereafter the combat base was able to requisition on the advanced depot, which forwarded to service command headquarters such requisitions as it could not fill.<sup>58</sup> Certain common supply items, particularly rations, had always been issued directly by the SOS to combat bases and other AAF consumers, since it was not economical for the Eighth to duplicate existing SOS depot facilities.

More fundamental than any other problem was that of shipping. From the launching of TORCH until well into 1943, the European theater had a lower shipping priority than any other overseas theater in which American forces were actually engaged in combat. As a result of the TRIDENT conference the Eighth Air Force was given a relatively high priority, A-1b-4, other U.S. Army forces in the theater re-

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taining for a while the A-1b-8 priority.<sup>59</sup> The story is adequately summed up in the following statistical table of cargo landed in the United Kingdom for *all* U.S. Army forces there during the months listed:<sup>60</sup>

	<i>Month</i>	<i>Long Tons</i>
1942	August	186,281
	September	239,747
	October	143,830
	November	54,228
	December	36,927
1943	January	38,562
	February	20,373
	March	24,719
	April	60,784
	May	36,593
	June	176,033

Little wonder that in November 1942 General Eaker described the shipping situation as "tragic" or that optimism spread throughout the Eighth Air Force in June 1943.

Under these circumstances the allotment of shipping priorities among the several claimants in the theater had assumed crucial importance. Accordingly, SOS headquarters had undertaken a study to determine how best the allocations of tonnages might be made to reflect accurately the true needs of the theater. The resulting plan, adopted in mid-1943, undertook to achieve the closest possible coordination among interested agencies in England and between responsible authorities there and in the United States. Upon receiving monthly notification of shipping space allotted to the theater, SOS would indicate the priorities and tonnage allocations assigned by the theater. The new system, its inauguration coinciding with a sharp increase in the shipping made available for the European theater, operated successfully into 1944.<sup>61</sup> Still another problem of special concern to the Eighth Air Force was that of shipments lost at sea, all of which in 1942 the AAF Air Service Command had promised to replace. The Eighth could ill afford the loss of even a small percentage of its shipments and, in April 1943, expressed alarm over the failure to replace those lost. Fortunately, abatement of the submarine menace by June 1943, together with the increased tonnage allotted to the Eighth, eliminated this as a serious problem.<sup>62</sup>

Only to a small extent could air transport remedy the shortage of shipping, although ambitious hopes had been entertained in 1942.<sup>63</sup> Not

until January 1943 was there a European wing of the Air Transport Command; meanwhile, shipments by air were uncertain and the volume small, most of it during the winter of 1942-43 reaching the British Isles by way of the South Atlantic route.<sup>64</sup> In April the Eighth Air Force, which was looking increasingly to air transport for shipment of critical and emergency supplies from the United States, requested that a more adequate air transport service be established between the United States and the European theater, and a gradual increase in shipments began soon thereafter.<sup>65</sup> As with surface vessels, theater headquarters was the final arbiter in allocating air tonnages and priorities among claimants in the theater, and not until November 1943 did the VIII Air Force Service Command secure from it a regular monthly allotment of transport space. Even so, because it was the only force in the European theater currently engaged in combat, the Eighth received more than 80 per cent of the three million pounds of air cargo which arrived in the United Kingdom during 1943.<sup>66</sup>

Distribution within the theater was aided by Britain's excellent if hard pressed transportation system, which was supplemented by such trucking equipment as the Americans could supply. The control of rail and water transportation for all U.S. Army forces in the theater had been vested in the Services of Supply, but the Eighth Air Force, in keeping with the general AAF trend toward autonomy, tended to win an increasing responsibility for the reception and distribution of its own supplies.\* This tendency had become apparent in the early development of plans for the reception of supplies at British ports. Originally, all supplies coming into the British ports, of which Liverpool, Glasgow, Bristol, and Cardiff were the most important for the Americans, were received and moved from the docks by the SOS. But the VIII Air Force Service Command was not satisfied in 1942 with the handling of its supplies by the SOS, claiming that much time had been lost and much damage done to Air Corps supplies by inexperienced ground supply troops. Accordingly, the theater was prevailed on to permit the service command to set up an intransit depot of its own at Liverpool late in 1942. The bulk of incoming Air Corps supplies continued to be sent for sorting and distribution to Burtonwood, but the

\* In a similar development in the United States late in 1942 the Air Service Command established the New York Air Service Port Area Command which became in 1943 the Atlantic Overseas Air Service Command, with headquarters at Newark. This organization controlled all air service activities at the port and provided an important link between Patterson Field and the VIII Air Force Service Command.

new AAF Intransit Depot, by virtue of its specialized knowledge of Air Corps supply, routed large quantities of supplies directly to the new advanced depots and to the combat bases. The service command established additional AAF intransit depots in the Liverpool and Bristol port areas during 1943.<sup>67</sup> As a result of the development of the trans-Atlantic air traffic in 1943 the service command organized the first air intransit depot at the air terminal at Prestwick, Scotland, in April.<sup>68</sup>

The trend toward greater autonomy for the air force was also apparent in the development of ammunition depots, where stockpiles of bombs required handling by trained personnel under special conditions. Two Eighth Air Force depots were in operation by June 1943 at Sharnbrook in Bedfordshire and Barnham in Suffolk, and in July the SOS turned over to the service command its ammunition depots at Braybrook and Melton Mowbray in the 1st Bombardment Wing area and at Wortley in Yorkshire. Thus, the service command was able to control the allocation and distribution of all ammunition to combat bases from its own depots.<sup>69</sup>

The tendency to establish separate air force channels of distribution was less marked in other areas of non-Air Corps supply. The SOS continued to handle, store, and issue most items of chemical warfare supply, although the service command, in the spring of 1943, was planning to build two advanced chemical parks in the VIII Bomber Command area. The service command established at the advanced depots distributing points for medical supplies received from SOS depots. As has already been noted, base and advanced depots stocked many quartermaster items, and the aviation engineers drew their supplies directly from SOS engineer depots. Thus, the SOS continued to play a major role in the Eighth Air Force supply system for items other than Air Corps supply.<sup>70</sup>

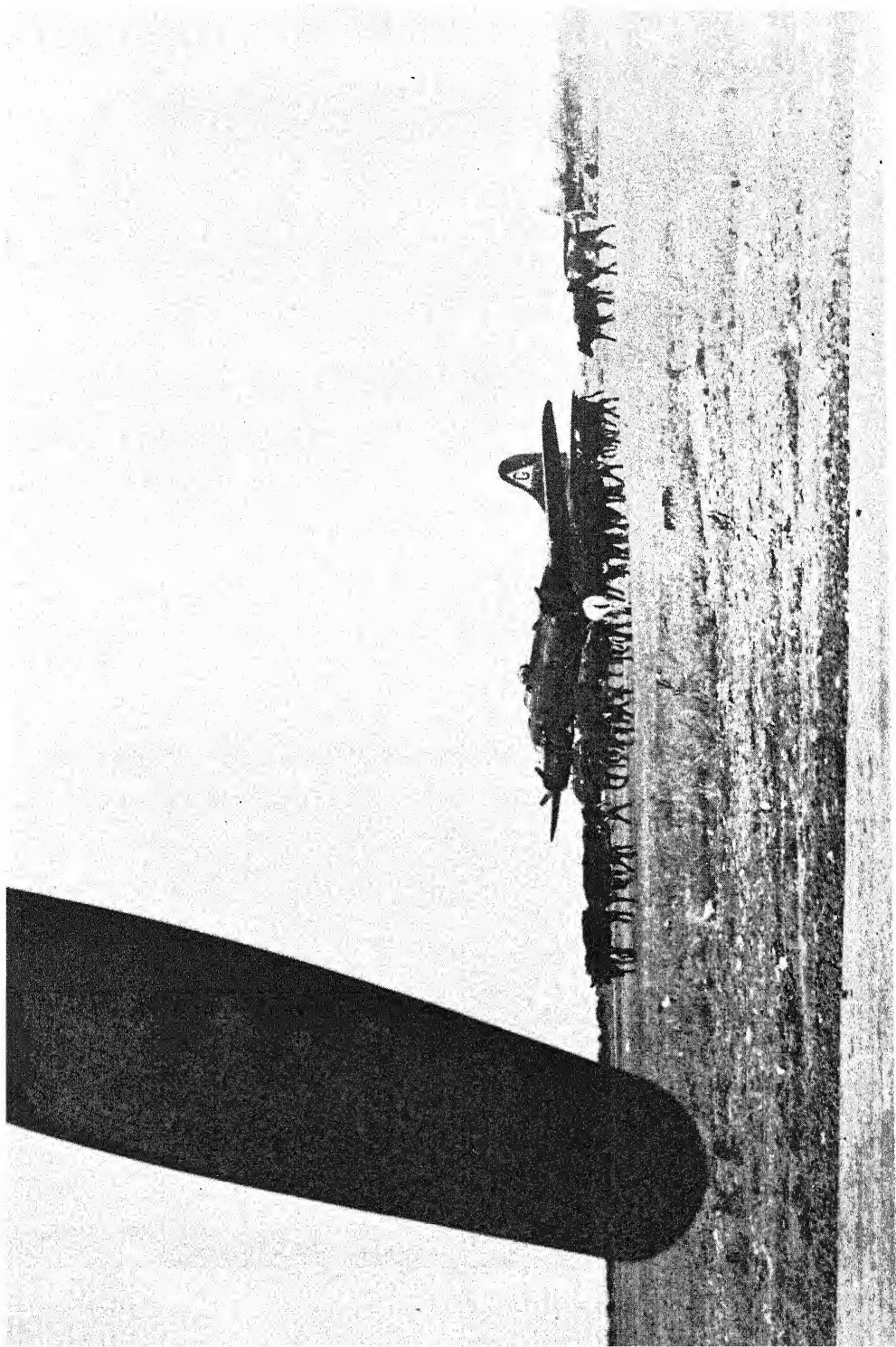
The distribution of probably the two most important items for the air war—aircraft and gasoline—deviated from normal supply channels. Tactical units which had flown their own planes across the ocean and were sent directly to their new bases presented no special problem, but replacement aircraft ferried in by the Air Transport Command were something else. To be sure, until the spring of 1943, the flow of replacement aircraft was small. Only sixty-seven planes, all heavy bombers, left the United States for the United Kingdom during the first three months of 1943,<sup>71</sup> but thereafter with a steady flow of combat groups











B-17 MILK RUN



and a greatly accelerated rate of operations in prospect, arrangements for a pool of replacement aircraft in the theater became an absolute necessity. In April 1943, the Eighth Air Force made the service command responsible for the initial reception of all replacement tactical aircraft and for their delivery to the proper destination. Through the months that followed, replacement aircraft, depending on the urgency of the current need, were sent directly to combat bases or placed in service command replacement pools at the base depots and on special storage airdromes. The service command was also responsible for ferrying within the theater, but until it could secure enough crews, it had to rely on assistance from crews provided by the tactical commands. Meanwhile, replacement aircraft departed from the United States in constantly growing numbers during the spring of 1943, jumping from 136 in April to 194 in May and 256 in June. Most of them were heavy bombers.<sup>72</sup>

The critical importance of aviation gasoline had produced joint Anglo-American machinery for control of its production and allocation. It was agreed in 1942 that all American aviation gasoline used by both the RAF and the AAF in the United Kingdom would be consigned to the British, on lend-lease, at American ports.\* British tankers then transported the gasoline to the United Kingdom for storage by the British Petroleum Board. This common pool was then drawn on by the RAF and the Eighth Air Force, with the Petroleum Board providing the vehicles which transported the gasoline to the American bases. In emergency situations, the American stations sometimes used their own vehicles to haul the fuel. The quantities distributed to the Americans were credited to the British reverse lend-lease account. The proportions of the job thus taken on by the British agencies are indicated by the fact that during 1942 the Eighth and the RAF consumed an average of 13,300 tons of aviation gasoline per week and during 1943, 28,900 tons per week.<sup>73</sup> In the opinion of qualified American observers, U.S. needs were well served.

The British Petroleum Board also stored and distributed other bulk gasoline items. The chief quartermaster, Services of Supply, controlled packaged POL (petroleum, oil, lubricants) items for the Americans and was in charge of their receipt, storage, and issue. The Eighth Air

\* Virtually all of the gasoline used in the United Kingdom from 1942 to 1945 came from American sources. The British were responsible for gasoline supply to the Middle East and China-Burma-India theaters.



Force's contribution was primarily one of participating in the planning of future supply and for the more efficient organization of distribution.<sup>74</sup>

While in the movement of the bulk of supplies from ports of entry to the base depots it was possible to depend on rail transportation, it became apparent as early as the summer of 1942 that the needs of the advanced depots, and even more of the combat bases, could not be met quickly enough by the overburdened British railway system. Accordingly, the service command had organized in the fall of that year a truck transport system linking Burtonwood with the advanced depots and combat bases. The truck companies of the various service groups were pooled under the Provisional Truck Transport Service, which thereafter exercised a central operational control over truck transport in the Eighth Air Force. By April 1943 the transport service had evolved into the 1511th QM Truck Regiment (Avn.), which operated along regular routes between Burtonwood and the advanced depots. Truck transport proved to be of particular importance to the regular delivery of bombs from the depots to the combat bases. The service command's trucks even handled considerable quantities of cargo for the SOS at intervals during 1943. As truck operations increased in scope during 1943, the trucking service proved itself more than a mere supplement to rail transportation; it became an indispensable means for the flow of supplies within the Eighth Air Force.<sup>75</sup> This flow was regular and speedy in spite of the narrow and winding British roads and the hazards of weather and blackout conditions.

In July 1942 the VIII Air Force Service Command had organized an air transport service for the rapid movement within the theater of personnel, cargo, and mail, using three borrowed C-47's. In October, it established the Ferry and Transport Service for control of intratheater transport activities and in April 1943 replaced it with the 27th Air Transport Group. Its major functions of ferrying aircraft and carrying cargo increased in importance with the growing stress on ferrying operations during 1943. The transport service established regular routes for passengers and cargo among the various headquarters and depots of the Eighth. The 27th Air Transport Group lent strong logistical support to the combat units of the Eighth by flying spare parts and other important supply items to bases and depots where there were grounded aircraft. In the second half of 1942, it moved little more than 800,000 pounds of cargo and ferried some 500 aircraft; during the first

six months of 1943, it carried more than 4,500,000 pounds of cargo and mail and ferried more than 2,000 aircraft.<sup>76</sup>

Overshadowing all problems of supply through the winter of 1942-43 had been the effect, still apparent in the spring of 1943, of obligations imposed on the Eighth Air Force for equipping and dispatching the Twelfth Air Force to Africa. Shortages of organizational equipment in Twelfth Air Force units, almost the rule rather than the exception, had been remedied by the simple expedient of taking the equipment from the Eighth and giving it to the Twelfth. Burtonwood had devoted most of its efforts during October and November to meeting the supply requests of the Twelfth and to the preparation of special ten-day pack-up supply kits for use in North Africa. After the Twelfth's departure from England it was estimated that it had taken 75 per cent of the Eighth's current stock of supplies. The Eighth turned over to the Twelfth all its steel plank runways, except for some in Scotland. Large numbers of vehicles were given to the Twelfth, 390 having been taken from heavy bombardment groups in the last ten days of October alone. Aircraft and spare parts belonging to the Eighth, or originally intended for its use, were fed into the Twelfth in large quantities. The Eighth performed the task on short notice, under great pressure, and with an organization as yet not even equal to its own needs. Although the estimate of the service command's supply division that the Twelfth Air Force "was approximately 99% equipped" when it left England was doubtless optimistic, it is clear that the extraordinary supply effort made by the Eighth achieved its purpose.<sup>77</sup>

British agencies controlled the movement from England to North Africa of the larger part of the Twelfth Air Force, which went by water, and supplied most of the ships.<sup>78</sup> But the dispatch of aircraft, which were flown to North Africa by the tactical units themselves or by Eighth Air Force ferrying crews, fell under the supervision of VIII Fighter Command. Later, when the job had been reduced to the ferrying of replacement aircraft, the fighter command turned it over to the service command. Prior to February 1943, General Spaatz gave to the Twelfth first claim on all replacement planes reaching the United Kingdom, and when the last replacement aircraft was finally ferried to North Africa in June 1943 it brought the total number of replacement aircraft dispatched from the United Kingdom to 1,072, of which more than half had been fighters.<sup>79</sup>

Unfortunately, the Twelfth's departure from England in October



and November 1942 had not freed the Eighth from responsibility for the provision of further supplies in support of TORCH. Although the Twelfth Air Force was supposedly to be supplied after D-day from the United States, the War Department had directed that the Eighth maintain a thirty-day supply reserve for the Twelfth and that all emergency requests be honored.<sup>80</sup> There were many calls through the earlier phases of the North African operation, and not until February 1943 was the Eighth relieved of responsibility for maintenance of the thirty-day reserve. Even then the older force was required to fill emergency requests from North Africa, some of which were honored as late as the summer of 1943.<sup>81</sup>

The effects of TORCH on the fortunes of the Eighth Air Force reached all the way down to the individual aircraft rendered inoperative for want of spare parts which had been shipped to North Africa and aggravated an already existing deficiency in organizational equipment.\* Standard procedure in 1942 usually called for the dispatch of a unit and its equipment on the same vessel or in the same convoy, but it was apparently not always possible to do this, for many combat and service organizations arrived in the theater with little or no organizational equipment. Often the equipment arrived months late and sometimes only part of it instead of all. Improper markings on containers and confusion at the ports of embarkation and debarkation contributed to the delays.<sup>82</sup> In January 1943 it was estimated that the Eighth Air Force as a whole had less than 50 per cent of its authorized equipment on hand. Service units, including ordnance, signal, and engineer organizations, suffered especially. In April, the service command estimated that its units had only 55 to 60 per cent of their equipment.<sup>83</sup> More than one service unit, lacking tools and other necessary equipment, had been reduced to performing housekeeping duties for combat units—an uneconomical but at times necessary use of its personnel.<sup>84</sup> The situation improved somewhat during the spring of 1943, when much of the original organizational equipment of the Twelfth Air Force, which had arrived in England after the Twelfth's departure and had been stored at Burtonwood, was made available for the use of the Eighth.<sup>85</sup> But even in June there were still heavy bombardment groups which possessed only a fraction of their organizational equipment.<sup>86</sup>

Ground and SOS units had encountered comparable difficulties, and

\* The equipment permanently issued to a unit on shipping ticket for use of the organization as a whole in performing its combat or service mission.

in the spring of 1943 the Army Service Forces decided to institute a scheme for the preshipment of unit equipment, that is, the shipment of equipment in advance of the unit. An easing of the shipping shortage enabled ASF to inaugurate the new plan late in the spring, a plan later recognized as having contributed greatly to the successful invasion of France. Meanwhile, improvement in the marking of containers and the provision of more specific advance notices of shipments to the Eighth Air Force further helped to overcome the earlier difficulties. Under the new arrangement, equipment preshipped was stored by the service command at Sudbury, in Derbyshire, until arrival of the unit for which intended.<sup>87</sup>

Additional shortages of various types of supplies—both Air Corps and common user—created their own problems. Since the aircraft could be flown to the theater but spare parts in the main had to be shipped by water, a time lag in the provision of spare parts forced resort to every possible expedient to keep planes in the air. Particularly short were the supplies of spark plugs and spare parts for superchargers, turrets, bomb-sights, instruments, and accessories. Difficulty was also experienced in securing an adequate number of special-purpose vehicles.\*<sup>88</sup> Spare parts for other vehicles were constantly in short supply, with a resultant hindrance to truck transportation. Shortages of parts for ordnance equipment, particularly for caliber .50 aircraft machine guns, became so acute that it was necessary to pool available spares in a single depot under a plan to fill telephone requests for them by special truck service. A gradual improvement with reference to ordnance supply was noticeable in the spring of 1943 when the service command began to stock combat stations with spare parts and supplies hitherto in critical shortage even at the depots.<sup>89</sup>

That operations theretofore had been restricted by inability to keep the logistical machine properly fueled is obvious, but ingenuity and improvisation had overcome many of the difficulties. Nowhere was this more evident than in the work of those charged with maintenance, to whose story the narrative now turns.

### *Maintenance*

When General Eaker, in April 1943, stated flatly that "Our Air Service Command is our weakest single factor in the Eighth Air Force,"

\* Special-purpose vehicles were those built to be used only for particular purposes, i.e., tank trucks, low loaders, etc.

he had chiefly in mind problems of maintenance.<sup>90</sup> These problems were in no small part a consequence of the closely related shortages of supply. Although the Eighth Air Force operated with a mere handful of planes in comparison with the numbers originally planned, it also had too little of everything else to permit maintenance organizations to perform their all-important function of keeping the maximum number of aircraft operational.

The over-all problem of maintenance in itself proved to be one of growing proportions and complexity, and the Americans had repeated occasion to be thankful for Britain's highly developed industrial system and her earlier experience in the maintenance of American-built planes. Originally, it had been assumed that maintenance in the Eighth Air Force would include chiefly the assembly, repair, overhaul, inspection, and general service of aircraft and related equipment.<sup>91</sup> And such proved, of course, to be the case. But German opposition of growing intensity to daylight bomber operations by 1943 had made the repair of battle damage a greater problem than had been anticipated, greater in fact than that met in any other American theater of war. Moreover, the constant struggle with the Germans for technical supremacy produced a vastly expanded demand for modification of American planes and stimulated the VIII Air Force Service Command to undertake in 1943 a program of engineering research and development.

The organization of maintenance services followed the broad outlines indicated on an earlier page. The base depot was responsible for complete overhaul of aircraft, the manufacture of certain items, on-site repairs in special cases, and for all fourth-echelon work that could not be done by the advanced depots. These advanced depots did fourth-echelon maintenance and repair, such third-echelon maintenance as was beyond the capacity of the combat bases, on-site repairs, and rendered other technical assistance to combat units. Service groups located on the combat stations carried the main burden of third-echelon repair, while the combat squadrons performed their own first and second echelons of maintenance. The Maintenance Division of the service command provided general supervision of all maintenance and held responsibility for policies and procedures.<sup>92</sup>

In practice no hard and fast lines divided the echelons of maintenance. The three echelons supposed to be performed on the air-drome were virtually fused into one, primarily because the work was done on the same base by units which worked closely together. Failure

of the advanced depots to lend any real measure of assistance to the combat bases until well into 1943, and the seeming remoteness of Burtonwood, produced a reluctance on the part of combat units to intrust their planes and materiel to hands other than their own. The combat bases showed an inclination to perform as much maintenance and repair on their own planes as they possibly could, and sometimes more than was advisable, even though they were not supposed to undertake repairs which would require more than fourteen days of work. Thus the bases tended to become bogged down with work while Burtonwood and later the advanced depots had sometimes a dearth of such work.<sup>93</sup>

Limitations imposed on operations by maintenance difficulties forced close study of the problem, by the interested commands no less than by the air force headquarters. Thus a bomber command study covering the period 21 October 1942–31 March 1943 reported that 588 aircraft, or 21 per cent of all dispatched on the 34 missions of the period, had suffered battle damage and that 512, or 87 per cent of the damaged planes, had been repaired by the bomber command itself. The small number of planes sent to the service command, 58, or 10 per cent of the total damaged, had taken much longer to repair. Of the planes sent to the service command during the first three months of 1943, only 46 per cent had been repaired within thirty days.<sup>94</sup> The service command could point out, of course, that the planes sent to it were the more severely damaged and naturally required more time to repair. It could also point to the fact that its personnel had rendered special assistance in some of the work accomplished on combat bases. But it was clear that a disproportionate share of the burden had been carried by the combat bases and that this practice was attributable in part to the desire of the combat group, hard pressed to keep a maximum number of its planes ready for operation, to save time. It was no less clear that the practice often proved uneconomical and that close attention must be given to the whole problem of maintenance.<sup>95</sup>

Further study and experience indicated, however, that no basic fault existed in the original organization, that subsidiary and related problems of supply and training were as much responsible for the difficulties experienced as anything else. Of vital importance were the lack of spare parts and the shortage of tools and other equipment. The 1st Bombardment Wing, largest in the VIII Bomber Command, reported that on 20 November 1942 one-fifth of its aircraft were out of com-

mission because of a lack of such items as spark plugs and spare parts for propellers and turrets.<sup>96</sup> The need received emphasis from the widespread practice of cannibalizing; as the number of "hangar queens" increased, many of them were immobilized for long periods of time or completely ruined.<sup>97</sup> During a trying period of operations, these planes had served to keep other planes in the air, but the practice was obviously wasteful and could best be remedied by an adequate supply of parts.<sup>98</sup> Similarly, a shortage of such tools as jacks, reamers, and rivet guns contributed to keeping aircraft nonoperational. The shortage, moreover, resulted in a maintenance of low quality which was reflected in the number of airplanes failing to complete missions because of mechanical faults.<sup>99</sup> And this condition, in turn, further increased the over-all work load.

Both the service command and the combat commands found reason to complain that ground crews and service unit mechanics had been inadequately trained. It was natural that they should have considered this problem, in common with other overseas commands, from the point of view of their own urgent needs and that they should have failed to appreciate fully the tremendous problems of training faced by the AAF in the United States.<sup>100</sup> Within the Eighth Air Force itself, the service command complained of improper use by the combat commands of service units, which at times had been relegated to base house-keeping duties as "dog robbers" for the combat units.<sup>101</sup> This situation would be fully remedied only by the arrival of the eagerly sought station complement squadrons,\* beginning in the summer of 1943. On the question of training, as with the problem of supply, men could point to the adverse influence of TORCH. Many of the better-trained maintenance units and men had been turned over to the Twelfth Air Force, not to mention the work done by Eighth Air Force mechanics on planes destined for TORCH.<sup>102</sup>

The tendency of combat units to do most of their own maintenance could be explained partly by the delayed development of the advanced depots.<sup>103</sup> Although the need for at least one advanced depot had been so great that in November 1942 the development of Little Staughton had been given the highest construction priority of all installations for the VIII Bomber Command area,<sup>104</sup> the first B-17 did not arrive at Little Staughton for maintenance until 25 April 1943.<sup>105</sup> During May

\* These units, with an authorized strength of 11 officers and 108 enlisted men, had responsibility for station defense, transportation, utilities, messing, etc.

the only advanced depots actually in operation, Honington and Little Staughton, completed repair work on a total of eight aircraft. Most of their work, which was concerned largely with technical inspections, repair of aircraft parts, and installation of nose guns on heavy bombers, was curtailed by the lack of skilled personnel, machinery, and tools.<sup>106</sup>

Meanwhile, mobile repair units had helped to provide much-needed help for the combat bases. Originally planned by the service command in September 1942, these units of sixteen to nineteen specialists were equipped with a truck, a jeep, and two trailers fitted out with required tools and supplies for on-the-spot repairs. Their primary task was to repair crash-landed aircraft at the site of the landing to the extent that would permit their being flown to the depots for more extensive repairs, and thus to save the time that would be lost through use of the alternative procedure of disassembling the plane for transfer to the depot. But the mobile repair unit, working out of an advanced depot, also proved to be a repeatedly useful emergency crew for the assistance of over-worked maintenance facilities at the combat base.<sup>107</sup> The first mobile repair unit had been turned out, with full equipment and personnel, at Langford Lodge in December 1942 and began its operations early in 1943. In February, the service command decided to provide fifty more such units, the task falling chiefly on Burtonwood and Langford Lodge. By the end of June mobile units had done repair work on almost 200 aircraft, far more than the advanced depots themselves had done. During the last six months of 1943, when their numbers steadily increased, the mobile units repaired an average of sixty-seven aircraft per month, thereby establishing themselves as an invaluable part of the Eighth's maintenance system.<sup>108</sup>

If much of the trouble traced to a disinclination of combat stations to send their planes the relatively long distances which separated them from the base depots, it was still true that these depots in the spring of 1943 were not yet ready for anything approaching full operations. Though the service command from the first had given its chief attention to the development of the base depots under a plan to assign to them the heaviest burden of maintenance, only Burtonwood was in position to carry any considerable load and that thanks chiefly to the almost 5,000 British civilians who constituted the main part of its staff. Warton, destined eventually to share with Burtonwood the bulk of heavy maintenance, operated in June 1943 at about 10 per cent of its planned capacity.<sup>109</sup> To meet the need for trained personnel, the service



command had suggested during the spring that Warton be operated by the Lockheed Overseas Corporation, with American civilian personnel. But AAF Headquarters rejected the proposal in accordance with its plan eventually to operate all depots with military personnel.<sup>110</sup>

Langford Lodge, meanwhile, had begun substantial maintenance operations by November 1942. The Lockheed Overseas Corporation operated the depot under contract with the War Department and under the supervision of the VIII Air Force Service Command. Manned by some 3,000 civilians, of whom half were skilled American technicians and half were local Irish workers, Langford Lodge handled virtually all types of aircraft; by January 1943 it performed a large portion of the engine and aircraft overhaul and aircraft modification for the Eighth. In addition to these maintenance activities, which were its most important activities during the first half of 1943, Langford Lodge assembled some fighter aircraft, repaired instruments and accessories, and manufactured and assembled modification kits. In all, more than 600 aircraft passed through the depot from November 1942 through June 1943. The inaccessibility of Langford Lodge from the combat bases in eastern England minimized its value as a repair depot, however, for only "fly in" aircraft could economically be brought there for repair.<sup>111</sup> Increasingly, it devoted its efforts to modification and to engineering and research.

Burtonwood, which remained the key depot for maintenance as well as for supply and eventually performed almost every type of maintenance work, continued to function under joint British-American control. In addition to its British civilian staff, it had about 1,500 American soldiers and approximately 1,000 American civilians who had been brought from the San Antonio Air Depot in Texas during the fall of 1942.<sup>112</sup> The efficiency of operations suffered at times from differences of opinion between British and American authorities. The much lower-paid British civilians resented the highly paid but poorly qualified American civilians. Military personnel, working side by side with the American civilians, found cause for resentment in the latter group's inferior abilities and higher pay.<sup>113</sup>

Burtonwood did most of the work entailed in the overhaul of engines, which reached a rate of 100 per week in the service command by the middle of 1943. It overhauled propellers, carried the main responsibility for inspection of aircraft, repaired instruments and accessories, performed fourth-echelon aircraft repair, and gave increasing

attention to modification. In April 1943, for instance, the depot modified 75 aircraft while repairing only 11.<sup>114</sup> The Eighth Air Force had pledged itself in 1942 to take over all responsibility for the heavy maintenance on British-operated aircraft of American construction in the United Kingdom. Not only did it prove impossible to fulfil this pledge but the Americans in fact remained more heavily dependent for assistance with their own work than had been intended. Although one-third of the engine overhaul capacity at Burtonwood was being used in the spring of 1943 for British-operated planes, two-thirds of the depot's labor force was also British. British civilian firms still performed fourth-echelon overhaul of certain items of equipment—chiefly superchargers, propellers, and instruments.<sup>115</sup> British agencies also rendered especially vital assistance in the work of assembly and salvage which marked the beginning and the end for American planes in the theater.

Since bomber aircraft were flown from the United States under their own power, the planes to be assembled were chiefly fighters. Shipped by water after the BOLERO route was closed to fighters in the fall of 1942, they were assembled for the most part at plants which operated under the control of the Ministry of Aircraft Production at Speke, near Liverpool, and in addition during the latter part of 1943 at Renfrew, near Glasgow. Langford Lodge and Burtonwood assembled some planes, but during 1943 the Eighth proved unable to assume full responsibility for assembly of its aircraft as in 1942 the service command had intended. To reduce the burden on the theater, AAF Air Service Command decided in the spring of 1943 to ship fighters partially or almost wholly assembled on aircraft carriers and on the decks of tankers, rather than as heretofore disassembled in crates. But this practice, while of some help, presented in itself new problems.<sup>116</sup>

Salvage involved the stripping of usable parts from nonreparable aircraft, which crashed in virtually all parts of the United Kingdom, and disposing of the rest as scrap. As with assembly, the VIII Air Force Service Command in 1942 had intended to perform its own salvage, but the familiar shortages of manpower and equipment argued against the establishment of a salvage organization. Accordingly, the RAF No. 43 Group undertook to salvage Eighth Air Force planes in addition to those of the RAF. Although No. 43 Group requested assistance from the Eighth and received a nominal amount from time to time, it continued to perform virtually all of the salvage work for the Eighth into

1944, by which time the abundance of replacement aircraft and spare parts had reduced salvage to little more than a scrapping operation.<sup>117</sup>

The modification of aircraft was destined to become the largest, and probably the most significant, of the maintenance functions of the VIII Air Force Service Command. Operational experience had quickly demonstrated the need for changes in both the structure and equipment of the American planes, and an enterprising foe allowed no time for relaxation. In this field of modification, the VIII Air Force Service Command occupied a key position in the maintenance of channels extending from the combat units, with whom the original impetus for change tended to originate, through AAF agencies in the United States to the aircraft manufacturers who would incorporate approved changes in their later models. Nineteen modification centers, whose task was to modify planes already built, had been set up by the AAF in 1942, and these centers had handled a total of more than 4,000 aircraft by the end of that year.<sup>118</sup> But agencies in the United States, however well conceived and equipped, could not meet the full need for modification. The time lag between the determination of an operationally required modification in the theater and the arrival there of the modified plane from the United States was too great for combat groups whose needs were usually urgent in the face of dynamic German aerial tactics. Constant additions to the list of desired modifications meant that practically every aircraft which arrived in the theater, no matter how many changes had been made on it in the United States, required additional modifications before it could be used in combat.<sup>119</sup>

The VIII Air Force Service Command had made no early plans for the establishment of modification centers in the United Kingdom. Indeed, it seems to have had a rather casual attitude toward the whole problem of modification, as though its implications had not been grasped. Modification in the theater was to be kept to a minimum, and in general its accomplishment would follow the echelons of maintenance. As much as possible would be done on the combat bases, and advanced and base depots would devote their attention almost wholly to fourth-echelon work. The Maintenance and Repair Division of the service command would provide supervision, among its other duties.<sup>120</sup> By the end of the year, however, it had become apparent that no casual approach to the problem would do. The frantic drive to install nose guns in the B-17's beginning in November and December 1942, coming on top of the work being done for the Twelfth Air Force, greatly in-

creased the heavy modification burden. Many of the combat units continued to perform modification of their own planes, but it was becoming increasingly necessary to depend upon the superior equipment of the depots.<sup>121</sup>

The resultant pressure on the depots soon forced General Miller to ask for assistance from the modification centers in the United States. In a letter to General Stratemeyer, chief of Air Staff, on 20 March 1943, Miller spoke feelingly:

At the present time all of my activities are swamped with modifications upon new aircraft arriving in the Theater.... These modifications vary from 100 to 1,000 man hours and even beyond that. It is vital that the modification centers in the United States get into full-out operation and ensure that aircraft arriving in the Theater will be operational.... I know that with the pressure on, the Combat Command agrees to take the aircraft as is. However, as soon as it arrives over here then they are equally insistent that I perform the modification as of yesterday.<sup>122</sup>

Whatever the help that could be gained in the United States, it was nonetheless evident that something further must be done to meet the need in the United Kingdom. In February 1943, the bomber command and the service command agreed on standard lists of modifications for the B-24 and the B-17 and set up priorities for the various items. The great need for P-47's, which began arriving in the ETO early in 1943, caused the service command to fit them into its priority system immediately behind the top priority planes for TORCH but ahead of the heavy bombers. This priority system, which also listed items within each type of aircraft, proved difficult to follow because of the conflicting demands from within and among the combat commands for rush and special jobs by the advanced depots and because of the frequently changing nature of their requests, even for the same modification item.<sup>123</sup>

In May 1943 a special committee composed of representatives of the service command and the combat commands attacked the problem afresh. Its careful review of the subject during the next four months was accompanied by changes in organization and practice recommended by the committee. The combat commands undertook to publish periodic statements of the relative priority of their modification requests. In July the service command for its part began publishing so-called "staging letters" on the various types of aircraft, detailing the nature and the priority of modifications to be performed and the stages at which the work should be done.<sup>124</sup> It was agreed that modification of

replacement aircraft would be done at Langford Lodge, but changes during the summer of 1943 led to the division of the work among all three base depots, which also fabricated sorely needed modification kits which became indispensable for performance of modification at lower echelons. Aircraft arriving with combat groups were modified on their home bases with the assistance of mobile repair units and working parties sent out from the service command depots.<sup>125</sup>

Despite the progress accomplished in line with the committee's recommendations, modification remained a major problem. Hundreds of man-hours had to be expended in the modification of each aircraft reaching the theater. Early B-17 modifications had been limited chiefly to the installation of gun mounts, flame dampeners, and IFF equipment, but by June 1943 the list of standard modifications included fifty-five items for B-17's and forty-three for B-24's. Fighter modifications were concerned chiefly with propeller blades, ignition systems, armament, and jettisonable tanks. The first P-47 staging letter listed forty-eight items for modification.<sup>126</sup> At the end of June 1943, according to available records, the service command had modified 228 heavy bombers, 6 medium bombers, 83 light bombers, and 609 fighters—a total of 926 aircraft, not including an unknown number of C-47's and other aircraft. Of this total, a large proportion, chiefly P-38's, P-40's, and A-20's, had been modified for the Twelfth Air Force. These figures would soon be dwarfed by the great outpouring of modified planes from the huge and revitalized base depots.<sup>127</sup>

## CHAPTER 19

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### *BUILD-UP*

THE great expansion of the AAF in the European theater from the late spring of 1943 forward stemmed from the strategic decisions taken at the Casablanca and TRIDENT conferences of January and May 1943. At Casablanca the way had been cleared for the AAF's participation on a full scale in the strategic bombardment of Germany. At the Washington conference in May the Combined Chiefs of Staff had indorsed the plan for the Combined Bomber Offensive (subsequently designated Operation POINTBLANK) as a preliminary to the invasion of western Europe in the spring of 1944 (OVERLORD) and had resolved that "the expansion of logistical facilities in the United Kingdom will be undertaken immediately."<sup>1</sup> The decision in favor of OVERLORD was made firm at the QUADRANT conference meeting at Quebec in August 1943 when the Combined Chiefs tentatively scheduled the invasion for 1 May 1944, decreed that POINTBLANK meanwhile must "continue to have highest strategic priority," and accorded to OVERLORD an overriding priority with reference to further Mediterranean operations against the Axis.<sup>2</sup>

As a result of these closely related decisions the AAF faced the task of establishing in the European theater not one but two air forces, each with a well-defined mission of its own. In addition to a rapid build-up of the forces required for the strategic bombardment of Germany, it would be necessary to place in the United Kingdom forces equipped, trained, and organized for the close support of an amphibious invasion and of the large-scale ground operations that would follow it. The priority naturally belonging to the bomber offensive would ease the huge task of scheduling the movement from the United States of men, supplies, and equipment, but it was hardly less inescapable that the two forces must be built up simultaneously.



The Eighth Air Force, whatever the imperfections still existing in its organization, enjoyed the benefit of more than a year of hard-won experience in the theater and required chiefly the necessary men and planes to prove itself an efficient instrument of strategic bombardment. Its organization still reflected an original mission combining strategic bombardment with operations in direct support of ground forces which tended increasingly to be described, for reasons of convenience, as tactical operations. But after the summer of 1942 the Eighth Air Force had been so geared to the mission of strategic bombardment as to raise a serious question of whether it would not be better to establish a separate tactical air force specially equipped and organized for support of the invasion. That question required closer attention than otherwise would have been the case because OVERLORD was to be a combined operation of British and American forces. Plans for the AAF's participation had accordingly to be adjusted to the over-all structure of a combined command, the character of which would be determined only after extended debate.

### *Origins of AEF*

Although the Anglo-American chiefs in January 1943 had in effect decided to postpone the invasion of western Europe until 1944, they had also taken steps to assure the continuance of necessary planning for that operation. It was agreed that a supreme commander should be appointed when the operation appeared to be "reasonably imminent," the commander to come from the nation providing the major part of the forces to be used, and that meanwhile an Anglo-American planning staff should be established under the direction of a British chief who would act in the place of the supreme commander until the latter's appointment. The "Roundup Planning Staff," a small group which after the North African invasion had continued to work at Norfolk House in London on plans for an invasion in 1943, offered a nucleus of the required staff. This organization being predominantly British in composition, it was recommended that the American personnel assigned to it should be increased.<sup>3</sup>

The Combined Chiefs, after discussing several proposed drafts, finally issued a directive on 23 April 1943 for the establishment of the new headquarters. By its provisions, Lt. Gen. Frederick E. Morgan, an experienced British planning officer, became chief of staff to the supreme allied commander (designate), a title ordinarily rendered in

the abbreviation COSSAC, which in common usage served to describe the office as well as the man who headed it. Morgan would report directly to the British chiefs of staff and to the commanding general of ETOUSA as the representative of the American Joint Chiefs of Staff. The new headquarters, actually established by General Morgan on 17 April in advance of his receipt of the formal directive, was charged with the preparation of (1) a camouflage and deception scheme for the summer of 1943 with at least one amphibious feint designed to draw the Germans into a large air battle; (2) plans to cover the eventuality of a German collapse in advance of the Allied invasion; and (3) plans for a full-scale assault on the continent in 1944.<sup>4</sup> An American officer who had participated in the planning for ROUNDUP, Brig. Gen. Ray W. Barker, became deputy to Morgan, whose staff was organized into three main sections—operations, administration, and intelligence. A central secretariat rounded out the organization. Each of the three sections included British and American army, naval, and air force officers, although the intelligence section was almost exclusively British in composition.<sup>5</sup> Beginning thus as a small Anglo-American planning staff, COSSAC would develop with time into the Supreme Headquarters, Allied Expeditionary Force.

Although the American representation at COSSAC was increased during 1943, the headquarters remained predominantly British in its makeup and for reasons that are readily apparent. General Eaker had appointed Brig. Gen. Robert C. Candee, commanding general of the VIII Air Support Command, as the chief AAF representative at COSSAC, but since Candee retained command of VIII Air Support Command, he could devote only part of his time, with the assistance of five junior officers, to the new assignment. The RAF, on the other hand, had appointed a "staff of twenty able officers, headed by an Air Vice Marshal," or so Eaker reported to Arnold in June with a warning that we "must build up our planning strength more nearly comparable to that of the RAF." He continued: "We always find ourselves overmatched in these conferences, and consequently the plans, as might be expected, are other people's plans and not ours."<sup>6</sup> The plea from the European theater for a larger complement of qualified staff officers became a familiar one at AAF Headquarters in the months that followed, but the AAF could not meet the demands made on it from all over the world and it was evidently not inclined to favor the claims of a combined headquarters over those of an American headquarters. Even though Washington

staff officers later remarked, as had Eaker, that the RAF always placed superior officers in generous numbers on combined staffs, they failed to follow the British example, thereby contributing to a disproportionate RAF influence which they tended to fear and to deplore.<sup>7</sup>

Candee directed his attention to the requirements of a tactical air force, urging upon Eaker in April immediate action to secure from the United States necessary bomber, fighter, reconnaissance, and service units in order that their training might begin at an early date.<sup>8</sup> Any such action, however, necessarily awaited fulfilment of some of the prior claims of strategic operations, a closer study than yet had been made of over-all requirements, and settlement of certain larger questions of organizational control.

As early as January, Air Chief Marshal Portal, at Casablanca, had pointed to the fact that the RAF in the United Kingdom, like the Eighth Air Force, operated from static bases and thus lacked in its current organization the mobility that would be required for support of cross-Channel operations.<sup>9</sup> In approving the CBO Plan in May the Combined Chiefs noted that "steps must be taken early to create and train a tactical force" in the European theater for the "close support required for the surface operations."<sup>10</sup> Sir Alan Brooke, Chief of the Imperial General Staff, at the same time indicated that the RAF was taking action to provide the mobile type of organization necessary for use with the expeditionary force.<sup>11</sup> In June the RAF set up within its fighter command a special force which was to develop under the direction of that command an organization for cross-Channel operations.<sup>12</sup> For over a year the Eighth Air Force had possessed in the VIII Air Support Command an organization especially designed for tactical air operations; to that command, in June, Eaker transferred the 3d Bombardment Wing of the VIII Bomber Command, which was equipped with medium bombers.<sup>13</sup> Thus by summer both of the Allied air forces had taken the initial steps toward providing their respective components of the expeditionary air force.

The Combined Chiefs having approved the principle of a single air commander for the invasion,<sup>14</sup> Portal in June proposed that an air officer be given a responsibility for planning parallel with that held by General Morgan as COSSAC. Conferences among Portal, Devers, and Eaker subsequently resulted in an agreement that Air Marshal Sir Trafford Leigh-Mallory, air officer commanding in chief, RAF Fighter Command, should have the responsibility for drafting air plans for the inva-

sion, an appointment to be made without prejudice to the eventual selection of the air commander in chief.<sup>15</sup> By early July, Leigh-Mallory had set up an Allied air staff at Norfolk House, with Brig. Gen. Haywood S. Hansell, Jr., who had recently replaced Candee at COSSAC, as his deputy. In addition to work on the air phase of operational plans developed by COSSAC, the new staff gave its attention to the composition and organization of the tactical air forces to be employed. It was anticipated that the staff would itself evolve into a combined air headquarters for the invasion.<sup>16</sup> As usual, the American representation on the staff was small, but in General Hansell the AAF had provided one of its more experienced planners.

### *Plans for the Build-up*

Meanwhile, the AAF had directed its attention to the problem of drafting a comprehensive and detailed program for the build-up of its forces in the United Kingdom. Moved partly by the demands of an approaching crisis in manpower that had led Lt. Gen. Joseph T. McNarney, deputy Chief of Staff, to request that the needs of all overseas commands be restudied,<sup>17</sup> General Arnold in mid-April had asked General Eaker to undertake an immediate study of Eighth Air Force requirements. Eaker was also informed that Maj. Gen. Follett Bradley, air inspector of the AAF, would reach England in the near future as the head of a committee for drafting a final program.<sup>18</sup> Bradley received his directive on 1 May, with instructions to "explore completely the possibilities of operating, maintaining, and supplying our estimated ultimate aircraft strength from the United Kingdom, using as a guide a maximum of 500,000 Air Force personnel."<sup>19</sup>

Accompanied by Col. Hugh J. Knerr, deputy commander of the Air Service Command in the United States, General Bradley arrived in England on 5 May.<sup>20</sup> He submitted his report to Arnold under date of 28 May. Eaker and Lt. Gen. Jacob L. Devers, who had succeeded to the command of the European theater following the tragic death of Lt. Gen. Frank M. Andrews in an airplane accident in Iceland on 3 May, gave their indorsement to the report, Devers with certain reservations.<sup>21</sup>

The Bradley Plan, as this report came to be known, rested upon the assumption that the initial task was to build up the VIII Bomber Command to maximum strength for its role in the strategic bombardment of Germany. Second to this requirement only in point of time was the

## THE ARMY AIR FORCES IN WORLD WAR II

build-up of those elements of the Eighth Air Force which would undertake the direct support of the invasion scheduled to follow completion of the Combined Bomber Offensive. The bombers of the VIII Bomber Command in their strategic operations, "usually unsupported by fighters because of their deficiency in range," would continue to operate from fixed airdromes in England. Forces to be established for cooperation with the invading ground forces would also operate initially from English bases but must be prepared for movement, with supporting service elements, to the continent after D-day.<sup>22</sup> A distinction between the strategic air force and the tactical air force served to draw a useful line between forces whose mission had been outlined in the CBO Plan and forces to be charged primarily with support of the ground campaign.

The report called for a total allocation to the United Kingdom of 485,843 officers and men to be divided thus: 254,996 for the strategic air force and 230,847 for the tactical force. As of 31 May, the actual strength of the Eighth Air Force compared with its planned strength as follows:<sup>23</sup>

	<i>Actual</i>	<i>Planned</i>
Strategic Air Force (VIII BC, VIII FC, and 8th AF Hq.)	45,569	156,410
Tactical Air Force (VIII ASC)	4,884	139,593
Air Service Command (VIII AFSC)	12,848	189,840
Miscellaneous (VIII AFCC, Engineer Battalions)	11,247	
TOTAL	74,548	485,843

The proposed build-up, designed to achieve maximum strength in June 1944, set up the following schedule of unit strength to be reached by the end of the months specified:<sup>24</sup>

<i>Group Type</i>	<i>1943</i>			<i>1944</i>	
	<i>June</i>	<i>September</i>	<i>December</i>	<i>March</i>	<i>June</i>
HB	18½	25	38	46	46
MB	4	7	9	9	9
L/DB		1	3	10	15
Ftr.	5	9	16	24	24
Ftr. (N)			½	¾	¾
Photo		½	½	1	1
TC	½	4½	7½	9	9
Obs.	1	1	3	4	8
TOTAL	29½	48	77½	103½	112½

As this table indicates, units intended for strategic operations received priority as to their movement over tactical air force units. The

plan gave careful attention to the requirements of the service command, whose performance to date had been less than satisfactory to all concerned, and made for it a generous allowance of 189,840 out of the total air force personnel. But despite the committee's recommendation that "positive provision be made for arrival in UK of associated service units prior to the tactical units to be serviced," the plan actually gave a lower priority to the movement of service units.<sup>25</sup>

Like all such papers, the Bradley plan served chiefly as a useful basis for further planning. AAF Headquarters announced on 7 July that it would follow the plan in shipping units to the theater,<sup>26</sup> but not until 18 August did the War Department give its approval and then only with important exceptions. It insisted on standard tables of organization\* for all units and denied the authority requested by Devers to increase some of the T/O's. The troop basis of 485,843 was accepted for planning purposes only, and as an immediate revision the War Department proposed elimination of several subordinate headquarters of VIII Air Force Service Command considered important by that organization.<sup>27</sup> Eaker and Devers strongly protested, especially with reference to the changes affecting the service command.<sup>28</sup> The War Department agreed to recognize the plan as a closely integrated statement of requirements, but it continued to urge a reduction in the proposed strength of the service command.<sup>29</sup> It would be 21 September before Eaker could notify his commanders that the War Department had finally accepted the Bradley plan. And by that time not only had the document been more than once revised but planning at all levels had advanced to a point that made the decision not too important.<sup>30</sup>

Indeed, the Bradley plan had been concerned largely with questions of internal organization and allocation that in the nature of things had largely to be left to the determination of those commanders who carried the responsibility in the theater. In advance of the completion of that study, the Combined Chiefs of Staff at their Washington conference in May had agreed on a build-up of forces in the United Kingdom to provide by 1 May 1944 an American air strength of 112½ combat groups (to include 51 heavy bombardment and 25 fighter groups†)

\* These are tabulations prescribing the total strength in officers and men for given types of units, fixing the number assigned in each grade and, in many instances, the specific command, staff, or duty assignment.

† Actually one fighter and five heavy bombardment groups more than were listed in the Bradley plan.



## THE ARMY AIR FORCES IN WORLD WAR II

and 7,302 unit equipment aircraft.\* At the same time, RAF strength would be built up to 213½ squadrons with 4,075 unit equipment aircraft.<sup>31</sup> By July 1943 the Combined BOLERO Committee† had been revived and in London was engaged in planning accommodations for American forces on the assumption that by 30 April 1944 American forces in the United Kingdom would total 1,340,000, broken down as follows: ground forces, 567,000; service forces, 325,000; air forces, 448,000.<sup>32</sup> This last figure represented a reduction in comparison with the Bradley figures, and it was remarkably close to the actual strength at which the AAF in ETO leveled off in 1944. The Combined Chiefs at Quebec in August set the ultimate AAF goal at 115¼ groups and 6,779 unit equipment aircraft.‡ This represented a reduction in the number of American aircraft, but heavy bomber strength had been raised to 54 groups and the fighter force to 35 groups.<sup>33</sup> The same month the AAF raised its estimate to 56 heavy groups.<sup>34</sup>

Early in October, AAF Headquarters sent to England a group of officers headed by Col. Joseph W. Baylor, for the purpose of revising the Bradley plan, particularly with a view to effecting economies in headquarters and service personnel. As a result, the troop basis of 502,000 recommended in the latest revision of the Bradley plan was reduced to 466,000.<sup>35</sup> A decision that same month to establish the Fifteenth Air Force in the Mediterranean, with 15 heavy groups diverted for its use from those scheduled for the United Kingdom, brought the planned strength of the AAF in ETO down to 41 heavy groups and 415,000 officers and men.<sup>36</sup> By the end of November the build-up planned for accomplishment by the following June forecast with surprising accuracy actual strength as of 1 July 1944:<sup>37</sup>

<i>Group Type</i>	<i>Proposed (30 Nov. 1943)</i>	<i>Actual (1 July 1944)</i>
HB	41½	40½
MB	8	8
LB	3	3
Ftr.	36	33
TC	10	14
<b>TOTAL</b>	<b>98½</b>	<b>98½</b>

\* Unit equipment aircraft were the number assigned to tactical units in accordance with prescribed tables of equipment. At this time, unit equipment of AAF squadrons was as follows: HB, 12; MB, 16; LB, 16; Ftr., 25.

† See Vol. I, 564.

‡ The RAF objective was now 224½ squadrons and 4,014 unit equipment aircraft.

The number of troop carrier groups had been raised to 14 in December by a decision to transfer the 52d Troop Carrier Wing with its four groups from the Mediterranean.<sup>38</sup> The reduction in the number of fighter groups is explained by a decision of March 1944 to leave in the Mediterranean three P-38 groups scheduled for transfer to the United Kingdom.<sup>39</sup>

The actual build-up of forces in the United Kingdom had proceeded steadily since May 1943. At the close of that month the AAF had in the ETO 16 operational groups, of which 10 were heavy bombardment units. By December the total reached 37  $\frac{3}{4}$  groups—21  $\frac{3}{4}$  heavy bombardment, 4 medium bombardment, 9 fighter, 2 troop carrier, and 1 photo reconnaissance—and this total would be raised by the addition of 8 groups before the end of the year.<sup>40</sup> From the end of May to the end of December total aircraft strength increased from 1,420 to 4,618; combat aircraft jumped from 1,260 to 4,242.<sup>41</sup> The growth during 1943 had been in those categories of primary concern to strategic bombardment; in general, units destined for the tactical air force were not scheduled to move until early 1944. Nothing in war, of course, ever goes exactly according to plan. Training programs had fallen behind schedule on occasion and other difficulties had been experienced, but the flow of combat units from the summer of 1943 had carried increasing assurance of the AAF's ability to meet its heavy commitments for 1944.

The picture is quite different, however, when one turns to consider the build-up of service units. Faulty planning, reflecting a general tendency in the AAF to emphasize its combat group program at the expense

*Eighth Air Force Groups Becoming Operational*

1943	HB	Ftr.
June	100th	
	381st	
	384th	
July	385th	
	388th	
August	390th	353d
	482d	
September	389th	352d
	392d	355th
October		55th
		356th
November	401st	
December	445th	20th
	446th	358th
	447th	359th
	448th	

of service organizations, had produced a serious lack of balance between combat and service units by the summer of 1943. Toward the end of the summer the Eighth Air Force learned that there were not enough trained service units in the United States to meet the requirements scheduled in the Bradley plan. The shortage of standard units was further complicated by failure to make provision for certain special units called for in that plan.<sup>42</sup> In August, General McNarney, after a personal investigation of the problem, directed the AAF to eliminate the existing deficit of service units by positive and immediate action. If necessary, the AAF should defer the activation of additional combat units until the desired balance had been achieved.<sup>43</sup> But the remedy could not be provided so easily as this. Shipping commitments in advance of D-day were such that the bulk of service personnel for the AAF would have to be moved to the United Kingdom by the early days of 1944. Thereafter available shipping would be required largely for the transport of the ground assault forces and supporting elements.

At the beginning of September, Arnold flew to England to discuss the problem with Eaker and his staff. The only answer seemed to be that of shipping immediately large numbers of available personnel as casualties for organization and training in the theater. Although this would impose an unforeseen burden on the Eighth Air Force, Eaker and Knerr, who had returned to the theater in July as deputy commander of the service command, urged it upon Arnold as the only possible way out of the impasse, and the latter promptly sent back the necessary order to Washington.<sup>44</sup>

By mid-September the AAF Air Service Command had begun to inactivate most of the units currently in its training program and to prepare their personnel for shipment overseas. Many of the men were trained specialists, but others enjoyed the benefit of little more than basic training and many of the officers were inexperienced. From all over the United States troop trains poured into Camp Kilmer and Camp Shanks, bringing their quotas for the shipments to the United Kingdom. The first and largest of the shipments of casualties to the European theater, in October, comprised 17,000 enlisted men and 3,000 officers. Later shipments were smaller, but they continued through the remainder of 1943 and into the spring of 1944.<sup>45</sup> At the end of September the strength of the Eighth Air Force stood just under 150,000. During the next six months the AAF in ETO would more than double in size, and by May 1944 it would have over 400,000 troops.<sup>46</sup>

The horde of casualties reaching the theater in October had caught the

replacement depot system of the Eighth Air Force unprepared. With less than a month's advance notice, the depots at Stone and Chorley hastily increased their capacity to 7,200 by the end of October, but the arrival of 20,000 casualties in the October convoys overwhelmed the facilities prepared. To cope with this "Gold Rush," as it became known, the service command acquired additional stations for the temporary accommodation of personnel. By December the capacity of the replacement depots had been increased to 32,000, although conditions on many of the bases which had been acquired for temporary use were poor. During 1944 the replacement depots, possessing trained personnel and adequate capacity, handled numbers as large as those encountered during the Gold Rush with much greater efficiency and dispatch.<sup>47</sup>

During the last three months of 1943 more than 45,000 casualties passed through the replacement depots, and by the end of March 1944 the total had topped 75,000. It became necessary to move men through the main depots at Stone and Chorley as rapidly as possible in order to make room for the next flood tide, with the result that the classification work centered there often fell behind, to the detriment of the individuals concerned. Many casualty officers, particularly in arms and services other than Air Corps, found themselves "in storage" on nonoperational combat bases where they might wait for several months before receiving a permanent assignment.<sup>48</sup> This situation, especially depressing to morale, was owing in part to the fact that the units for which the men were intended had not yet been activated. Over the course of the ensuing six months many casualties would be absorbed by hundreds of newly activated standard and special units, ranging in size from platoons to groups. Other casualties would be used for the rapid expansion of the base depots at Warton and Burtonwood.<sup>49</sup> Deficiencies of training were remedied largely by on-the-job instruction, but certain technical skills could be acquired only through more formal methods of instruction. In addition to the RAF schools upon which the Eighth continued to depend chiefly for technical training, the service command provided special courses of its own. The total of AAF personnel who completed technical training courses between October 1943 and D-day in the following June numbered more than 25,000.<sup>50</sup>

The responsibility for handling these and other problems attending the AAF build-up in the United Kingdom during 1943 fell chiefly on the Eighth Air Force. It had been assumed as early as the dispatch of the Bradley committee to England in May that a distinct tactical force

would be developed, but whether this would be through an expansion of the already existing organization of the VIII Air Support Command or through the creation of an entirely separate air force remained unsettled. Until late summer the new force usually appeared in planning papers as the Eighth Tactical Air Force.

On 31 July, General Arnold offered the command of the embryonic force to Maj. Gen. Lewis H. Brereton, then in the Middle East as commander of the Ninth Air Force. The plan for General Spaatz' Twelfth Air Force to absorb the units of the Ninth\* had raised a question as to General Brereton's next assignment, and his wide experience in three different theaters of operations argued for the choice now made.<sup>51</sup> Subsequent to the selection at Quebec in August of Leigh-Mallory for the command of the expeditionary air force, Arnold reached the decision that the tactical forces to be placed in the United Kingdom should be organized into a separate and numerically designated air force. Originally, it had been intended that the Ninth, upon the loss of its units, would be deactivated, but the force had built for itself a rich tradition and one moreover intimately associated with the commander-designate of the AAF tactical force planned for the European theater. Accordingly, on 25 August, Arnold directed that detailed plans be prepared for the transfer of the Ninth Air Force to the United Kingdom. On that same day Eaker, on a visit to North Africa, conferred with Brereton at Bengasi. It was agreed that the latter would come to England for about a week in September while en route to the United States and that he would probably be able to return early in October to assume his new command.<sup>52</sup>

In accordance with this agreement, General Brereton arrived in England from Egypt on 10 September. After conferring with Eaker on arrangements for the transfer of the Ninth Air Force, Brereton left for Washington on 14 September. He returned to England before 15 October. It had been agreed that only the headquarters and headquarters squadrons of the Ninth Air Force and of its bomber, fighter, and service commands, together with a few miscellaneous headquarters service units, would move from Egypt to the United Kingdom. The Eighth Air Force would provide the Ninth with its initial combat and service

\* See above, pp. 495-96.

† On 16 October the Ninth acquired the 322d, 323d, 386th, and 387th Bombardment Groups (M) and the 315th and 434th Troop Carrier Groups from the Eighth. The only other groups added before the end of 1943 were the 354th Fighter Group, 67th Tactical Reconnaissance Group, and the 435th Troop Carrier Group.

units, the VIII Air Support Command being absorbed in the process, but the air force would be built up in the main by shipments from the United States.<sup>53</sup> The details having been settled and the movements from Egypt partially completed, General Brereton on 16 October assumed command of the newly established Ninth Air Force with headquarters at Sunninghill Park in Berkshire.<sup>54</sup> In anticipation of this development and to simplify a variety of administrative problems arising from the presence in the theater of two separate American air forces, General Devers on 11 September, in accordance with directions from Washington, had designated Eaker commanding general of all United States Army Air Forces in the United Kingdom.<sup>55</sup> In the interim before Brereton's assumption of command, Eaker continued to exercise the necessary authority in his capacity as commander of the Eighth Air Force. But on 15 October he formally activated the United States Army Air Forces in the United Kingdom (USAAFUK), to which had been assigned administrative control of both the Eighth and Ninth Air Forces.<sup>56</sup>

This administrative control by USAAFUK greatly facilitated the adjustment of the Ninth Air Force to the established organization of air service agencies in the United Kingdom. Their organization for six months past had been shaped increasingly by an awareness of the fundamental difference between the mission of strategic and tactical air forces. The one would continue to operate from fixed bases in England, the other would require after D-day the utmost possible mobility.

In its review of service facilities the Bradley committee had made several recommendations, growing largely out of the experience of the Eighth Air Force, for improvement of air service in its support of strategic bombardment. It recommended approval of tables of organization or manning tables for such specially tailored units as subdepots, intransit depot groups, mobile reclamation and repair squadrons, and special station complement squadrons. It indorsed the principle of command that had led to control of service groups on combat bases by the base commander, but proposed that he have the assistance of two executives, one for air operations and the other for ground services. To free the service units from other duties for the performance of their primary mission, the committee recommended that each base be assigned a station complement and a guard unit. Finally, the committee proposed the reconstitution of service squadrons on combat bases as subdepots responsible for third-echelon maintenance and supply under



the command of the base commander but assigned to and operating under the technical control of the air service command.<sup>57</sup>

This attempt to draw a distinction between command and technical control is attributable largely to the influence of Colonel Knerr, who in July became a brigadier general. His years of experience in the field of air service and his effective reorganization in late 1942 of the Air Service Command in the United States had given special weight to his opinions—hence his position as Bradley's chief assistant on the committee.<sup>58</sup> In the committee report, Knerr had defined technical control as "control [of] the means and methods whereby the functions of supply and maintenance of air force equipment are accomplished, and whereby the employment and training of Air Service Command personnel are effected," and further, as including "responsibility for the assignment, technical operation and inspection of Air Service Command personnel, units and facilities." Thus the service command could enforce uniformity and obtain integration of the supply and maintenance functions all the way from the base depot to the combat base.<sup>59</sup> As an administrative adjustment to the distinctly different needs of the strategic and tactical air forces, the Bradley plan proposed an adaptation of the device of control areas then in use by the Air Service Command in the United States. There the control area, as the term itself suggests, represented a geographical division of command responsibilities. In England the proposed division between strategic and tactical control areas would be basically functional, at any rate until the tactical forces had been moved to the continent. Any attempt to define in detail the organization to be followed in the development of the tactical control area was left until plans for the tactical air force had taken more concrete form, but its intended mission was made clear enough by the provision that the strategic control area would draw together under one administrative control the activities of all advanced depots and other organizations serving directly the strategic air force. A third control area would combine the base depots at Burtonwood, Warton, and Langford Lodge under a base air depot area, serving both the strategic and tactical areas.<sup>60</sup>

Although War Department approval of the Bradley plan was still pending, General Knerr, as deputy commander of the service command, put the recommended control areas into operation on 1 August.<sup>61</sup> The Base Air Depot Area, with headquarters at Burtonwood, included in addition both Warton and Langford Lodge—later the three

would be redesignated, respectively, as the 1st, 2d, and 3d Base Air Depots. The intransit depots, including the air intransit depot at Prestwick, would also come under the control of the Base Air Depot Area.<sup>62</sup> With a change in the designation suggested by the Bradley plan but no alteration of function, the Strategic Air Depot Area and the Tactical Air Depot Area were both activated as of 1 August. The former took over the staff as well as the functions of the well-established Advanced Air Service Headquarters, and in still another redesignation advanced air depots became now strategic air depots. The number of these increased to four with the activation of a strategic air depot at Watton in August to serve the 2d Bombardment Wing.<sup>63</sup> Only slowly did the Tactical Air Depot Area acquire personnel and installations to meet the special needs of the VIII Air Support Command, but a beginning had been made when in October the area passed to the IX Air Force Service Command. War Department approval of manning tables for the several area headquarters came only in November.<sup>64</sup>

November brought also War Department approval for the reconstitution of service squadrons as subdepots. It was decided, in view of the somewhat different problem faced on fighter command stations, to undertake this change only on bomber bases. The subdepots were assigned to the service command, which exercised its technical control through the strategic air depots. Additional subdepots were organized as required, and when the Eighth Air Force reached its maximum bombardment group strength of forty-one it would have forty-one subdepots.<sup>65</sup>

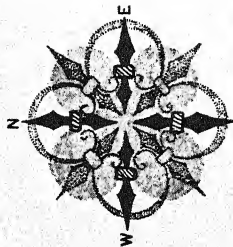
The rapid expansion of the Eighth Air Force during the summer of 1943 also persuaded the War Department to place its official seal of approval on an organizational plan for the bomber command long advocated by Eaker and indorsed by the Bradley committee. In September, therefore, the 1st and 2d Bombardment Wings were redesignated 1st and 2d Bombardment Divisions (H) and the 4th Bombardment Wing was redesignated 3d Bombardment Division (H).<sup>66</sup> The 3d Bombardment Wing, composed of medium bombers, had been transferred to the VIII Air Support Command in June and its designation remained unchanged until after its transfer to the Ninth Air Force in October. Directly responsible to the bombardment division headquarters, which exercised administrative as well as operational control, were the combat bombardment wings, each of which directed the operations, but not the administration, of two or three heavy bombard-

ment groups. In the spring of 1944 the three heavy bombardment divisions, each the full-fledged equivalent of a command, were directing the operations of forty groups organized into fourteen combat bombardment wings.

The expansion of facilities and installations to serve the growing forces of the AAF in the United Kingdom caused frequent concern during the latter part of 1943. Under agreements reached the preceding year the responsibility belonged principally to British agencies, but the limited force of labor available in Britain had been supplemented by American engineer troops. In June 1943 some 32,000 civilian workmen and 13,500 American troops were engaged in construction for AAF organizations. If the Americans found occasion to complain of slowness and inefficiency on the part of the civilian workmen or of the lack in quantity of the heavy construction equipment so familiar in the United States, the British for their part must often have wished that American plans could have been less subject to sudden change.<sup>67</sup>

As of 1 July 1943 the Eighth Air Force had fifty-eight airdromes, a number much in excess of its current requirements. Some of the sixty-six airdromes occupied by the Eighth and Ninth Air Forces at the close of the year were not yet operational, but all combat groups were adequately accommodated.<sup>68</sup> Concern shown by General Eaker in September over delays in the preparation of heavy bomber airdromes had been relieved by the subsequent decision to divert to the Mediterranean fifteen of the fifty-six heavy groups previously scheduled for the United Kingdom. The completion of technical facilities, housing, and roads frequently lagged.<sup>69</sup> A heavy expenditure of time and labor became necessary in the rebuilding or repair of runways and perimeter tracks which had been constructed of poor materials or of an inadequate thickness for the punishment given them by the American planes. It was often necessary to widen roads, built to the specifications of RAF equipment, for use by the generally larger and heavier vehicular equipment standard in the U.S. Army.<sup>70</sup> The completion and expansion of facilities for the service commands occasioned special concern toward the close of the year.<sup>71</sup>

But by the end of 1943 the building program was within a few months of completion, and fortunately so, because the greater number of combat groups for both air forces was scheduled to arrive in the theater during the first four months of 1944. Although the Eighth and Ninth Air Forces occupied only sixty-six airdromes in December 1943,



OATCHAM  
(OFF MAP)

# EIGHTH AIR FORCE INSTALLATIONS

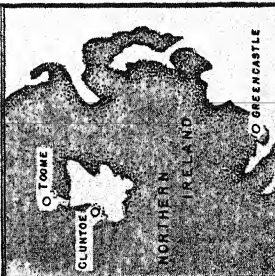
JUNE - 1944

## LEGEND:

- BOMBARDMENT DIVISION HQ
- ◆ FIGHTER WING HQ
- ◆ COMBAT BOMB WING HQ\*
- ◆ FIGHTER GROUP AIRDROME
- HEAVY BOMB GROUP AIRDROME
- TRAINING AIRDROME
- RECONNAISSANCE AIRDROME
- ⊕ STRATEGIC AIR DEPOT
- ⊕ CITIES

SCALE  
10 MILES TO 1 INCH

\*SITUATED ON AIRDROMES ALSO OCCUPIED BY BOMBARDMENT GROUPS AS INDICATED.



MOUNT FARM  
7TH PHOTO GROUP

EIGHTH AIR FORCE HQ  
HIGH WYCOMBE

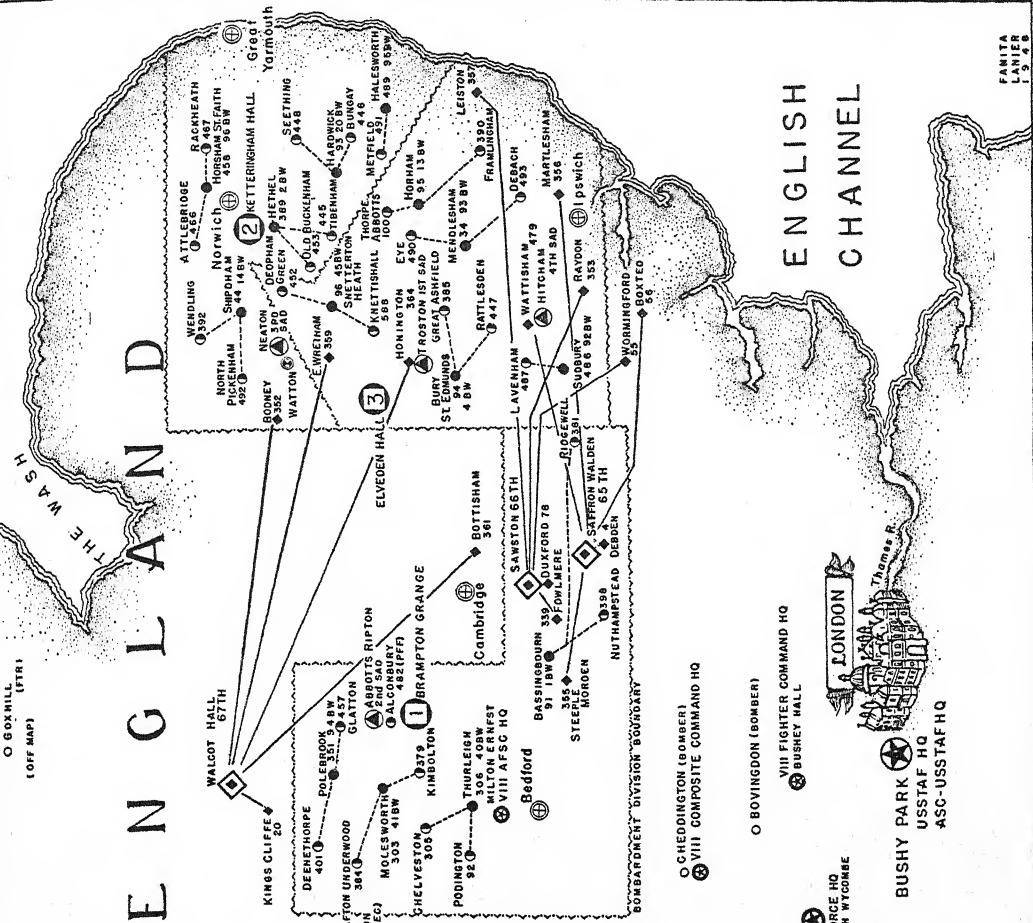
BUSHY PARK  
USSTAF HQ  
ASC-USSTAF HQ



O BOVINGDON (BOMBER)  
VIII FIGHTER COMMAND HQ  
VIII BUSBY MALL

O OXEDDINGTON (BOMBER)  
VIII COMPOSITE COMMAND HQ

O BOXHILL (FTR)  
(OFF MAP)



FANITA  
L 3 168

it was planned that they would eventually occupy 108 plus additional ones for depot installations. Plans called for the Eighth to have fifty-nine airdromes for its combat and training units—forty-three for bombers and sixteen for fighters. The Ninth was to have forty-nine airdromes divided among its bombers, fighters, and troop carriers.<sup>72</sup> The airdrome commitments for the Ninth would eventually be met only through the use of advanced landing grounds provided by the RAF.

Extensive depot facilities for both air forces were in operation by the end of 1943. The four strategic depots planned for the Eighth—Honington, Little Staughton, Watton, and Wattisham\*—were all operating at the end of the year.<sup>73</sup> In keeping with the expectation inherent in plans in 1943 that it would become increasingly independent of the Eighth Air Force for logistical support and eventually entirely free of any dependence, the Ninth Air Force planned to have a base air depot of its own and six tactical air depots. Before the turn of the year the Ninth had a base depot under way at Baverstock in Wiltshire, although it still relied heavily on the Eighth's base depots at Warton and Burtonwood. In addition, four of the six tactical air depots were at work—Stansted (Essex), Grove (Berkshire), Charmy Down (Somerset, near Bristol), and Membury (Berkshire).<sup>74</sup> Storage facilities for the two air forces were greatly expanded, in accordance with plans to provide five million square feet of storage space by the spring of 1944.<sup>75</sup>

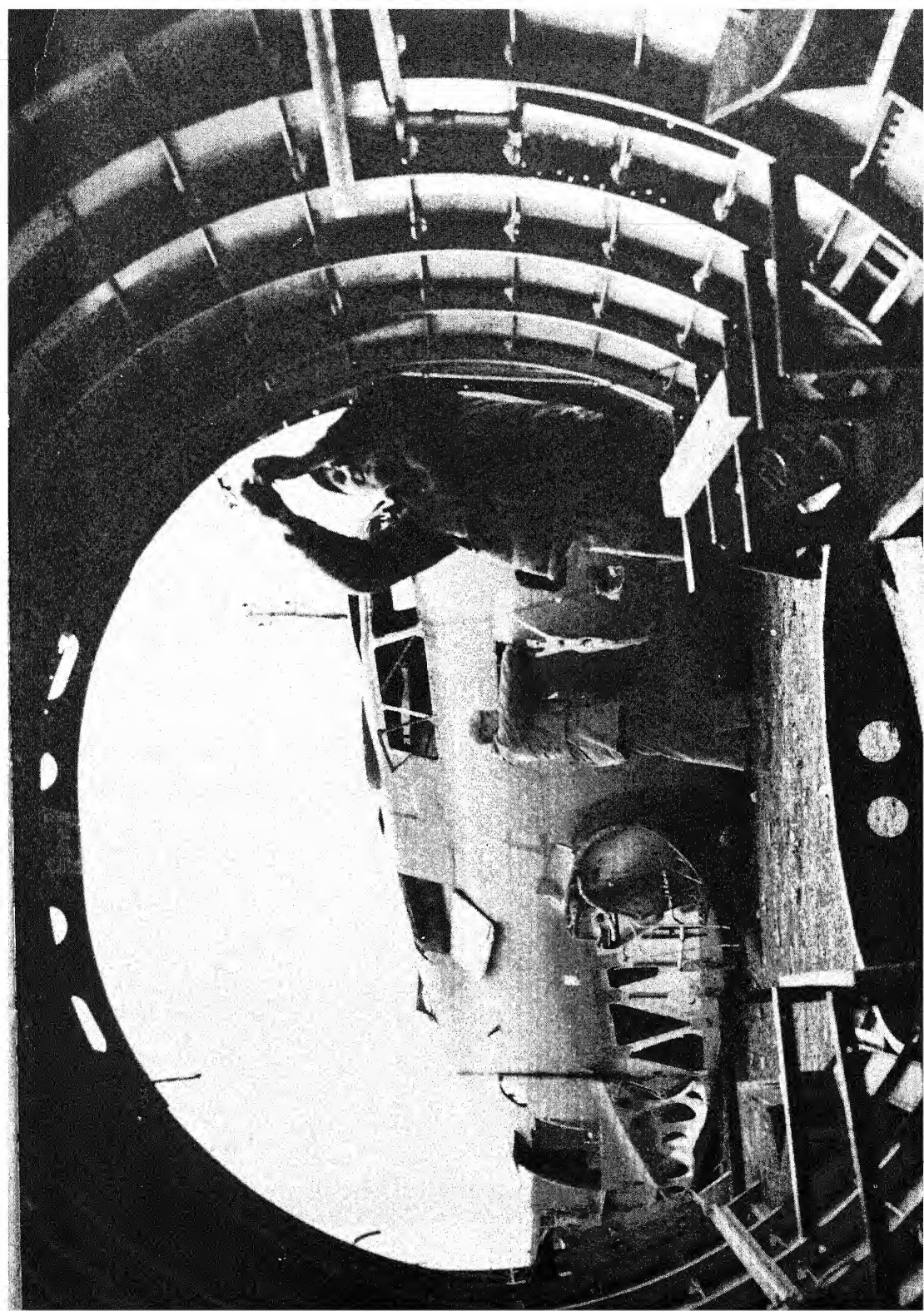
### *Aircraft, Bombs, and Fuel*

The entrance of a tactical air force into the European theater and the progressively greater demands of the strategic bomber offensive made necessary a vastly expanded and highly efficient supply system. General Knerr, to whom much of the responsibility fell, followed a policy resting on the principle of centralized control coupled with decentralization of operations. Many of the duties formerly performed by service command headquarters were transferred to the Base Air Depot Area, which thereafter controlled the requisition, reception, storage, and initial distribution of all Air Corps supplies in the United Kingdom. Indeed, BADA moved steadily toward complete technical control over all air service operations in the theater.<sup>76</sup>

The joint Anglo-American operation of Burtonwood came to an end

\* By June 1944 the four strategic air depots were Troston, Abbots Ripton, Neaton, and Hitcham.

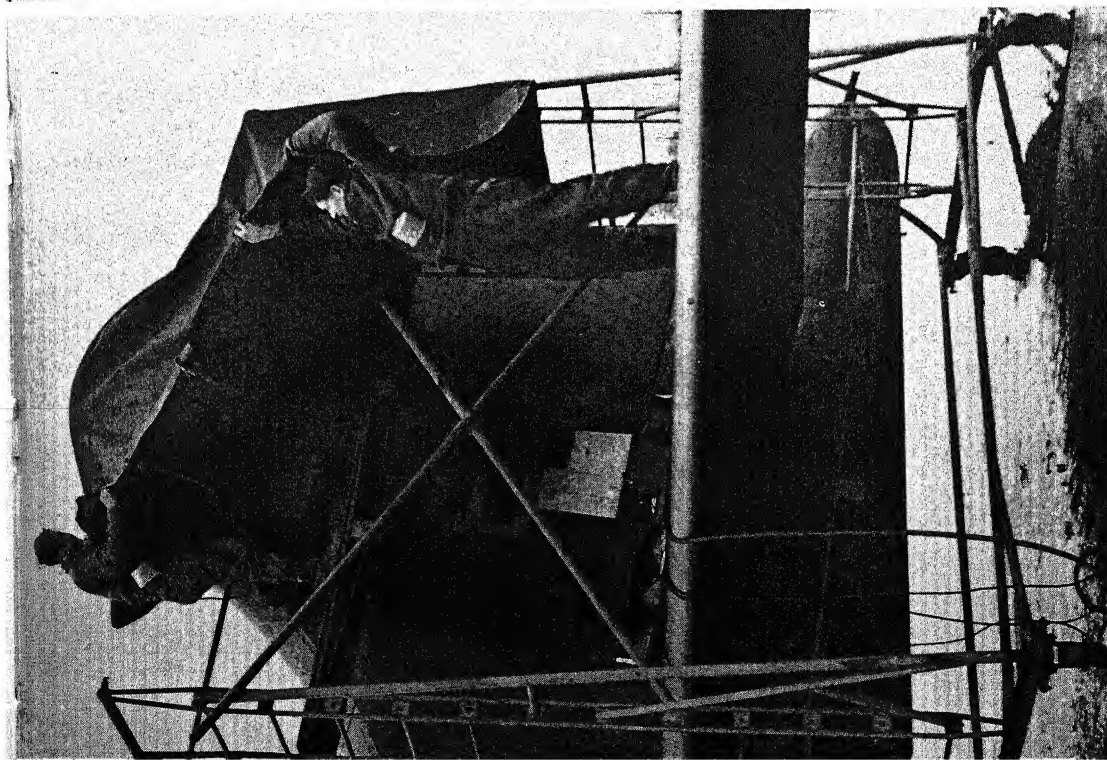
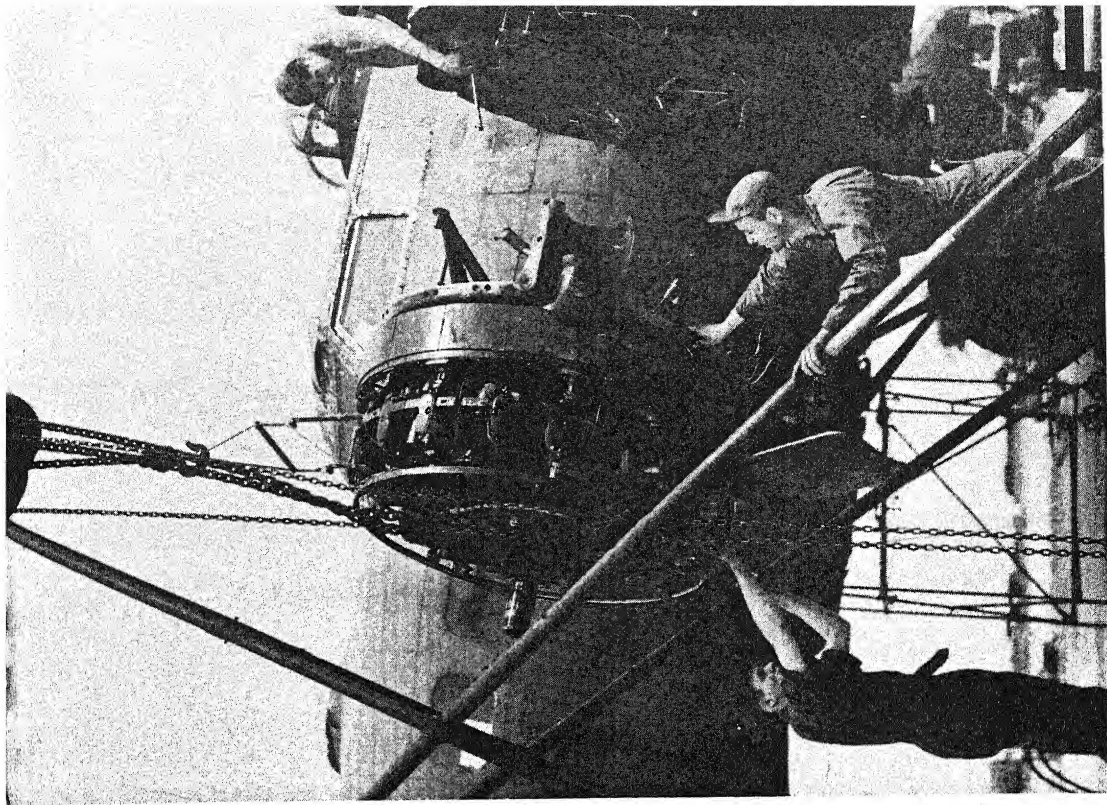


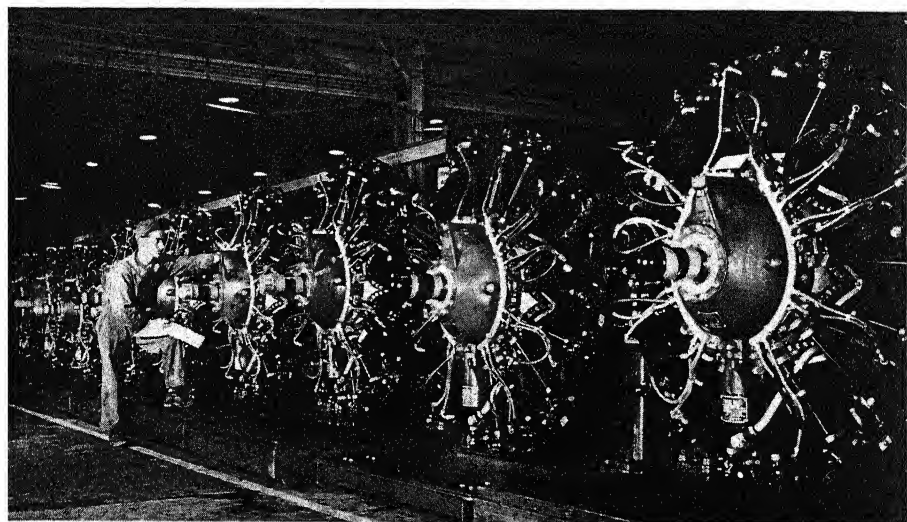






P-47 DRIVE-AWAY FROM AN ENGLISH PORT





in October, subsequent to which the depot was also completely militarized as American troops replaced both the British and American civilians on the production lines and in the warehouses.\* Similarly, the rapidly expanding depot at Warton was manned by AAF personnel. Eventually, the two depots would employ a total of more than 25,000 men and WAC's.<sup>77</sup> By the following February the combined capacity of Burtonwood and Warton promised that these two depots would soon be capable of carrying the whole burden for the theater. Accordingly, AAF Headquarters was notified that the contract with the Lockheed Overseas Corporation for the operation of Langford Lodge could be canceled as of 3 July 1944.<sup>78</sup>

General Miller having been transferred to the command of the IX Air Force Service Command in October, General Knerr succeeded him as head of the VIII Air Force Service Command which, being the senior organization, continued to function to a large extent as the theater air service command. The IX Air Force Service Command, like the Tactical Air Depot Area before it, requisitioned its Air Corps supplies directly from the Base Air Depot Area and placed through that organization requisitions for SOS items. The VIII Air Force Service Command also handled all procurement of supplies from the British. In order to avoid unnecessary delays, Eaker and Knerr agreed in December that the Ninth should be permitted to send direct to the United States cabled requisitions for items of supply for aircraft peculiar to the Ninth, but the VIII Air Force Service Command continued to requisition all items jointly used by the two air forces. It was anticipated, however, that an independent system of supply would have to be developed for the Ninth in advance of the invasion.<sup>79</sup>

General Knerr, convinced that experience argued for AAF independence in the field of logistics, undertook to win from the theater authority for control of all items of supply except food and clothing. Criticism of the Services of Supply came to be directed chiefly against its handling of ordnance and signal supplies. Early in the new year an effort would be made to secure authorization for establishment of completely independent channels of supply extending all the way from the ports of embarkation in the United States to the combat bases in England. But Army Service Forces refused to agree, basing its refusal on grounds of economy, and the end result was merely to bring closer

\* Most of the American civilians were returned to the United States in late 1943 and early 1944.



# USSTAF AIR SERVICE INSTALLATIONS JUNE - 1944

BASE AIR DEPOTS   
INTRANSIT DEPOTS 

OTHER DEPOTS   
TRUCK TRANSPORT STATIONS 

AIRDROME  
REPLACEMENT  
DEPOTS 



study in the theater of the problem of improved service to the air forces through established channels.<sup>80</sup>

Although rarely did it prove possible in 1943 to maintain the desired and officially authorized levels of supply, the latter half of the year witnessed a great improvement in the situation. Especially gratifying was the increased flow of replacement aircraft, amounting for the last six months of the year to 2,277 planes, of which 1,257 were heavy bombers and 723 were fighters. These totals were small by comparison with those for 1944 (when in the one month of July the theater would receive 2,245 planes), but they provided a most encouraging contrast with the earlier record.<sup>81</sup>

The AAF delivered its bombing planes, both heavy and medium, by way of the North Atlantic air route. Newly arriving units flew their own planes, with navigation provided by ATC pilots in lead planes which were usually replacement aircraft. For the delivery of the increasing number of replacements, the North Atlantic Wing of ATC operated a ferrying service which depended upon its now well-developed transport service for return of the pilots to the United States. The delivery of fighter aircraft was speeded up after the spring of 1943 by deck-loading partially assembled craft on tankers and escort carriers. It had been necessary to enlarge and improve dock facilities in England to solve problems of unloading which British authorities had initially regarded as too difficult to undertake. At points, houses and other buildings had to be torn down in order to widen streets leading from the docks to assembly areas. Special techniques were developed for quick removal of the coating of grease which had protected the planes en route against the corrosive elements of the sea. But all of these difficulties were overcome, and by the end of 1943 most of the planes arriving by water came deck-loaded.<sup>82</sup>

By early 1944 the Base Air Depot Area controlled the movements of all replacement aircraft prior to their assignment, and from its aircraft replacement pools in Lancashire and Northern Ireland, the 27th Air Transport Group delivered the planes to the combat groups. As with combat operations, the weather often interfered with delivery, at times for several days in a row. In retrospect, one of the Eighth Air Force's divisions felt that it would have been desirable to maintain replacement aircraft pools in the immediate neighborhood of the using units rather than in Lancashire and in Northern Ireland.<sup>83</sup>

Aviation fuel requirements for the rapidly expanding Anglo-Amer-



ican air forces rose sharply in the second half of 1943. There were no instances of shortages, but there was difficulty in securing what the British and Americans in the theater regarded as a satisfactory forward stockage for their joint needs. The Anglo-American petroleum authorities in the theater requested that a six-month supply of aviation gasoline be maintained in the theater. U.S. agencies recommended a four-month level, but no official stock level was set, even though the question was considered by the Combined Chiefs of Staff. The actual amount on hand in the United Kingdom hovered about the 1,000,000-ton mark during the first five months of 1944. At the rate at which the Americans and British were consuming aviation gasoline by that time, this amounted only to a two- to three-month supply, not enough to provide the comfortable margin desired by the air forces. Actual operations far exceeded the estimates of operations on which fuel consumption and stock-level planning had originally been based.<sup>84</sup>

In order to ease the burden on the overworked tank cars and pipe lines which carried the fuel from the west-coast British ports of entry, the Admiralty in October 1943 agreed that the tankers might unload in the Thames estuary, near London. This meant that the fuel was delivered at a point much closer to its ultimate users in East Anglia but, even so, it was clear that demands from the RAF and AAF bases would outrun available transportation facilities. Accordingly, the British undertook to construct a pipe line from the Thames into East Anglia, with a number of branch lines running to airdromes within a few miles of the main line. In April 1944, the heavy bomber station at Bassingbourn, in Suffolk, became the first of the American stations to receive its fuel supplies direct via pipe line. Meantime, storage facilities on the airdromes, long considered inadequate by the bomber stations, were being doubled and trebled—from a 72,000-gallon capacity at each station to 144,000 or 216,000 gallons.<sup>85</sup>

Although the provision of unit equipment improved during the second half of 1943, there were still shortages of particular types of equipment and sometimes of equipment for a whole unit. In July the Eighth Air Force estimated that combat groups arriving since 15 May possessed only 55 per cent of their authorized unit equipment. Quantities of preshipped unit equipment began to arrive late in July, and by the end of the year the problem had been largely remedied, except for certain special units and the newly organized service and air depot groups of the Ninth Air Force. In November, Knerr feared that the special

units would not be ready for D-day, and some Ninth Air Force units did continue to suffer from lack of equipment into the spring of 1944.<sup>86</sup>

Perhaps the most chronic shortage experienced by the air forces during 1943-44 was that of motor vehicles, particularly of 2 ½-ton trucks, regarded as the best of general-purpose vehicles. During 1943 a lack of spare parts further aggravated the shortage by keeping a large number of trucks out of commission, and by January the need to equip the Ninth Air Force for its mobile operations on the continent had lent a new seriousness to the problem. The total number of truck companies which had been authorized for the AAF in ETO would never be reached in the theater, and it even proved to be impossible to equip fully those units which were organized. The Eighth Air Force by April 1944 required a greater number of trucks than had been anticipated in order to haul the necessary bombs for its increasingly heavy operations. In that month the Eighth's 2 ½-ton trucks numbered 3,334, while 3,722 had been authorized; the Ninth had only 5,427 of its authorized strength of 7,376.<sup>87</sup>

The British continued to render assistance in overcoming critical shortages of specific items. After the Air Service Command in the United States had indicated its inability to provide replacement turrets for the B-26, the Eighth Air Force, acting in August 1943 through the Ministry of Aircraft Production, was able to secure production in Britain. The first turrets were received in October, and by December production equaled anticipated requirements.<sup>88</sup> During the latter part of 1943 the British also supplied quantities of flying clothing and other flying equipment. Especially noteworthy was the aid given in the development and manufacture of electrically heated clothing. In collaboration with the Eighth's air surgeon, Brig. Gen. Malcolm C. Grow, British firms developed greatly improved types of this equipment, together with electrically heated ear muffs and blankets.<sup>89</sup> By the end of the year the new clothing was in quantity production. In February 1943 the service command, in a move to conserve shipping space, had asked the Ministry of Aircraft Production to produce for it replacement aircraft tires and tubes; during 1943 deliveries to the Eighth totaled 3,955 tires and 2,811 tubes. Most of the requirements for tires and tubes by the AAF in ETO in 1944 would be met by British production.<sup>90</sup>

In 1943 it became increasingly clear that the future of Eighth Air Force operations depended greatly on the question of whether or not

fighter cover for the bombers could be provided on their deep penetrations of the continent. This, of course, was a problem of range, and short of undertaking to develop an entirely new-type fighter plane the jettisonable fuel tank offered the only answer. Consequently, the provision of the necessary tanks became, of all supply shortages, the one most vital to operations.

The need for jettisonable fuel tanks to extend the range of fighter escort had been foreseen by the AAF in 1942, and tanks had been produced during that year for some types of fighters—particularly the P-38 and the P-39.<sup>91</sup> In January 1943 the Eighth Air Force, which in the preceding October had inquired whether jettisonable tanks could be made available for its use, gave some consideration to local manufacture of tanks for the P-47. When German fighter opposition had shown the vulnerability of the unescorted heavy bomber, and after some prodding by General Andrews, the Eighth in February ordered 60,000 tanks of 200-gallon capacity from the United States. Experimentation in search of the best-suited tank led to a request in March to the Materiel Command at Dayton that a 125-gallon tank be substituted. Further work by fighter and service command engineers in England resulted in a design for a steel tank of that size, and with indications that progress by the Materiel Command had been slow, the Eighth Air Force in May requested that the British produce 43,200 tanks. The decision to have the tanks manufactured in England was also influenced by the consideration that much shipping space would be saved. The Ministry of Aircraft Production proposed the substitution of a 108-gallon paper tank which could be manufactured more quickly and easily. The Eighth successfully tested the tank before the end of June and approved its production.<sup>92</sup>

Anticipating that the British would be able to meet all requirements, in July the VIII Air Force Service Command canceled all requisitions for tanks from the United States. The first use of jettisonable tanks on a combat mission came on 28 July when the planes of two fighter groups carried older-type 205-gallon tanks, which the fighter command considered much less desirable than smaller ones. The paper tanks were not yet ready, but one was sent to the Materiel Command that same month for tests with a view to initiating production in the United States for all theaters.<sup>93</sup> The British had fallen behind and would be unable to keep to schedule under a further agreement of August to manufacture steel tanks of 100- and 250-gallon capacity for the Amer-

icans. Heavy bomber losses to German fighters during that month and the failure of the YB-40 as an escort destroyer brought a renewal of the request for aid from the United States. In response to requests of late August and early September for production of several types, the AAF acted to multiply the production of 150-gallon tanks and sent on to England all of 75-gallon capacity which were available. About ten thousand 75-gallon tanks reached England in October; by 12 October the British had been able to supply a total of 450 paper tanks.<sup>94</sup> The serious losses sustained on the October missions into Germany gave still greater urgency to Eighth Air Force efforts to speed the production of tanks in both the United States and the United Kingdom.<sup>95</sup> But not until the middle of December did the supply begin to approach requirements.

The British had increased production of both paper and metal tanks greatly during November, and by year's end the Ministry of Aircraft Production had delivered over 7,500 paper tanks of 108-gallon capacity. On 10 December there were some 18,000 paper and metal tanks of 75-, 108-, and 150-gallon capacity on hand at fighter stations for the three types of fighters then operating with the Eighth Air Force.<sup>96</sup> The paper tank having proved its worth in combat, requirements for Eighth and Ninth Air Force fighters through 1944 were set in January with good reason to believe that British production would equal the demand. At the same time, however, requisitions were sent for large quantities of 75-, 110-, and 150-gallon tanks from the United States. As D-day approached, all figures were raised, and production was hard put to keep pace.<sup>97</sup> In March the American fighters flew over Berlin for the first time—thanks to the jettisonable tank.

There were problems of distribution as well as of supply, and among the difficulties claiming the attention of Eighth Air Force headquarters during the summer of 1943 were those of the truck transport agency established the preceding year. Especially troublesome were disciplinary difficulties arising in the Negro truck units, where many of the men had been poorly trained before being sent to the theater. Their officers were white, too often of inferior quality, and some for other reasons had proved unsuited for duty with the Negro troops, whose morale sank steadily as the result of the discriminatory treatment received at many of the bases. Often, after hauling bombs and ammunition from morning till night through fog and rain, they were denied billets and meals and forced to sleep in their trucks after eating a meal

of K rations. There were some disturbances, and General Eaker considered the white troops to be responsible for 90 per cent of the trouble.<sup>98</sup>

In August 1943, largely as the result of a serious disturbance among some of the Negro troops in June, Eaker and Knerr reorganized the truck units into the Combat Support Wing, with a strong centralized headquarters organization, and placed all Negro units of the Eighth Air Force under it. The new headquarters served a dual purpose, although its major function remained that of operating a central trucking service for the air force. General Knerr also made a clean sweep of all officers above company grade previously assigned to the organization and ordered a wholesale weeding of unfit officers below field grade. General Eaker insisted on steps to eliminate discrimination, and a distinct improvement in discipline and morale followed.<sup>99</sup>

Meanwhile, the burden on the truck companies grew as the volume of supplies placed an increasing strain on the British rail system. From an average of 752,492 ton-miles per month for the period January–August 1943, the Combat Support Wing reached a monthly average of 1,677,101 ton-miles for the period September–November 1943. In October an express truck service between the base depots and the advanced depots was begun; the advanced depots and the subdepots operated their own feeder services from this main line. Bombs and ammunition continued to make up the bulk of the loads carried by the wing. In January 1944, when the Combat Support Wing had reached a strength of thirty-eight truck companies, it was placed under the Base Air Depot Area. Shortly after, sixteen of its fully equipped truck companies were transferred to the Ninth Air Force, which thus instituted its own truck service in preparation for its movement to the continent.<sup>100</sup>

The 27th Air Transport Group continued to be handicapped by lack of aircraft. Transport planes from the United States were going chiefly to troop carrier groups, and AAF Headquarters advised the service command to borrow planes from other agencies. The 27th overcame the plane shortage only by borrowing planes from the British, the IX Troop Carrier Command, and the AAF Air Transport Command and by using planes less desirable than the C-47, best of the twin-engine transport aircraft. Meanwhile, for the period August–December 1943, the 27th carried 3,292,830 pounds of cargo and mail and 13,441 passengers and flew 656,000 miles. During 1943 it ferried more than

8,000 aircraft and in the first six months of 1944, almost 16,000 aircraft. The Ninth Air Force set up its own air transport service late in 1943 with the activation of the 31st Air Transport Group.<sup>101</sup>

### *Assembly, Modification, and Repair*

The poor state of maintenance from which the Eighth Air Force continued to suffer into the summer of 1943 had alarmed others than General Eaker and his staff. The Bradley committee had given the subject close attention. Maj. Gen. Virgil L. Peterson, inspector general of the U.S. Army, had shown concern during the course of an inspection of the Eighth during June and July.<sup>102</sup> General Arnold took cognizance of the situation in a letter to General Eaker in June. "All reports I have received," he wrote, "have admitted that your maintenance over there is not satisfactory. . . . If your maintenance is unsatisfactory now with only a small number of airplanes, what will it be when you have much larger numbers?"<sup>103</sup> Only a thorough overhauling of the service command could make it into the efficient maintenance organization which Arnold and Eaker knew was indispensable for the scale of operations contemplated for 1944.

General Knerr, upon taking over as deputy commander of the VIII Air Force Service Command in July, undertook to carry out the recommendations of the Bradley committee. Having established the depot areas in August, he then sought a firm if necessarily flexible assignment of responsibilities among them. The Base Air Depot Area was made responsible for the reception, assembly, maintenance, storage, and modification of replacement aircraft. The advanced depots, both strategic and tactical, were to assist with the modification work when other duties permitted, but their primary function was the repair of damaged aircraft. The better to perform this work, which must be given priority over all other claims, the strategic air depots were to activate additional mobile repair and reclamation units. The Base Air Depot Area was required to keep other depots notified of its weekly repair capacity in order that they might send as much battle-damage repair work as possible to the base depots, thereby holding themselves available for the emergency requirements of the combat groups.<sup>104</sup>

In September, Knerr secured Eaker's agreement to the proposed return of third-echelon maintenance to service command control. General Arnold had urged adoption of this proposal of the Bradley committee, and Eaker reported that he had "issued a definite directive that



the Air Service Command is to have technical control and supervision of maintenance down to the airplane." Furthermore, he had "cautioned that every airplane which cannot be made ready for the next mission coming up must be transferred and tagged to the Air Service Command and the Air Service Command made responsible for its maintenance." He had instructed all, he concluded, that the combat squadrons would "do first and second echelon maintenance and the Air Service Command . . . all third and fourth echelon maintenance, wherever the airplane may be."<sup>105</sup>

The resulting centralization of responsibility for maintenance under the VIII Air Force Service Command permitted the establishment of standard procedures for all echelons of maintenance. In November, Eighth Air Force Memorandum No. 65-6 drew a firm line between the first two echelons of maintenance and the third by directing that combat units perform maintenance and repair work only on aircraft which could be repaired within thirty-six hours. The Strategic Air Depot Area had already anticipated this development in an earlier directive of its own. Aircraft which required more than thirty-six hours of work were to be turned over to the subdepot or service squadron which, if it could not make the repairs, would pass them on to the advanced depots. Subdepot repair capacity was to be augmented by the use of work parties from the advanced depots, which could be sent to the bases where groups had sustained especially heavy damage. Work beyond the capacities of the advanced depots was still to be sent to the base depots, which also retained all of the functions previously allotted to them. The responsibility for some of these functions was further delineated in December when the base depots were charged with third- and fourth-echelon repair of aircraft accessories and parts except for some third-echelon items which were to be handled by the strategic depots.<sup>106</sup> By the end of 1943 the strategic depots performed a large share of the total maintenance work for the bomber and fighter commands. By spring of 1944 each of the strategic air depots, built around two air depot groups, had reached a strength of 3,500 to 4,000 men.<sup>107</sup>

The VIII Air Force Service Command controlled the newly established subdepots on combat bases and exercised technical control of the maintenance done by ground crews through the issuance of technical instructions prescribing the type and extent of work to be done at the various echelons. The fighter command retained control of its service squadrons. The nature of its repair work was different from that re-

quired for bombers, and the establishment of subdepots would have robbed the organization of a degree of mobility considered desirable in view of the possibility that all fighters might be moved later to the continent.<sup>108</sup>

The base and strategic depots, of course, abandoned all ideas of remaining mobile and became more than ever fixed installations. The VIII Air Force Service Command recognized the inevitability of this development and proceeded with the expansion of the depots, aware that they would be the chief answer to the efficient functioning of maintenance.

The expansion of the base depots permitted an increasing specialization in their work. In December all radial engines were assigned to Burtonwood for overhaul, while all in-line engines were sent to Warton beginning in January.\* Langford Lodge manufactured kits and repaired electrical propellers, and its engineering staff devoted much time to research and development. It was possible also to introduce assembly-line methods which permitted maximum utilization of the large numbers of unskilled soldiers who now helped man the depots.<sup>109</sup> Specialization and the assembly lines explain in large part the great productivity of the base depots beginning late in 1943.

Helpful too was internal reorganization of Burtonwood and Warton along the functional lines suggested by the Bradley plan. All of the personnel at Warton and Burtonwood, with the exception of some specialized units, were assigned to one of three divisions—military administration, supply, and maintenance—and the former units to which they had belonged were done away with completely. The maintenance division was by far the largest of the three, including more than 10,000 men at Burtonwood alone by the middle of 1944.<sup>110</sup>

During the latter part of 1943 and in early 1944 the Eighth Air Force surmounted the personnel and equipment difficulties which had so severely handicapped its aircraft maintenance down to the summer of 1943. Although the service command did not receive from the United States the trained technicians it desired for its depots, it did receive thousands of men during the Gold Rush period who subsequently were trained on the job or in technical schools. The subdepots were manned largely by personnel from the former service squadrons, but many new subdepots had to be formed with personnel fresh from the United

\* The P-51 and the P-38 had in-line engines; the P-47, B-26, C-47, B-17, and B-24 had radial engines.

States. The strategic air depots were not expanded as greatly as were Burtonwood and Warton, which had to receive, organize, and train thousands of men while at the same time constantly expanding their services for the air forces. Furthermore, during the last few months of 1943 the base depots had to give up part of their trained fourth-echelon maintenance personnel to help man the IX Air Force Service Command's new base depot and tactical air depots. The VIII Air Force Service Command sent additional thousands of both trained and untrained men to the Ninth to form the service groups which provided third-echelon maintenance for the combat groups. By the spring of 1944 maintenance was well enough in hand for Spaatz and Knerr to accede to Arnold's request to send back to the United States experienced maintenance personnel for the new B-29 groups then being formed.<sup>111</sup>

The equipment and spares shortages of 1942-43 would also be overcome by D-day. The American industrial machine came into full play during 1943, more shipping for the United Kingdom became available, and distribution increased in efficiency. Preshipment of unit equipment also helped. Particular difficulty was encountered in equipping the depot repair squadrons of the IX Air Force Service Command for which preshipment of equipment had not been arranged far enough in advance. As late as March and April 1944 some of these squadrons had as little as 10 per cent of their unit equipment, but the deficiencies were remedied in time for D-day.<sup>112</sup> Warton was short of the heavy equipment needed for fourth-echelon repair and overhaul throughout the summer and fall of 1943, with a consequent limitation on operations. Burtonwood continued to carry the main load, but with 1944 Warton would pick up more and more of the burden.<sup>113</sup>

The assembly of aircraft\* became an increasingly important function of the VIII Air Force Service Command during the fall of 1943 as the fighter group strength of the Eighth mounted steadily and the fighter groups of the Ninth began to arrive. The flow of replacement fighter aircraft increased sharply also, rising from 58 in September to 178 in December and 377 in January 1944. During 1943 the British-controlled plants at Speke and Renfrew continued to perform most of the assembly work for the Eighth, assisted in some measure by the small assembly area at Sydenham, near Belfast, which was operated by

\* In the case of partially assembled planes, the work consisted chiefly of degreasing the aircraft and attaching the wings.

Langford Lodge employees. By October the service command knew that increased facilities would be needed to handle the anticipated heavy flow of aircraft, which would also include A-20's for the Ninth Air Force. Although the capacity of the assembly plants in October was theoretically 800 aircraft per month, actual production was much less and fell short of requirements.<sup>114</sup>

The pressing need for long-range escort fighters in November and December focused attention on increasing the production of assembled aircraft at Speke and Renfrew. Knerr seriously considered using an expanded service group to militarize Renfrew in the belief that he could get greater production and cut down the backlog of unassembled planes. The urgent need for P-38's and P-51's induced the VIII Air Force Service Command to establish at Burtonwood in December a P-38 "production line" for simultaneous assembly and modification of planes. In the same month the service command ordered that all boxed aircraft, by this time only a small proportion of the total, be assembled at the base and strategic air depots instead of at Speke and Renfrew in order that the assembly plants might concentrate all of their efforts on the partially assembled planes which arrived on tankers and carriers.<sup>115</sup>

With the addition of new assembly capacity at Burtonwood, production mounted steadily as successively larger shipments of fighters arrived during the first part of 1944. In January, Burtonwood assembled 389 aircraft while Speke and Renfrew produced only 219. But the British plants increased their production as the year progressed until they were meeting Knerr's request that they handle two-thirds of the assembly work. In April alone they would assemble more than 600 aircraft.<sup>116</sup>

Modification of aircraft absorbed a larger and larger percentage of the total maintenance effort from the summer of 1943 forward. The arrival of large numbers of replacement fighter aircraft added to the load, which heretofore had come largely from requirements for modification of the big bombers. Since the Base Air Depot Area already supervised the assembly of fighters, combat groups felt that the base depots also should take responsibility for modification. Before the end of 1943 the base depots were modifying, in addition to heavy bombers and fighters, B-26's and C-47's.<sup>117</sup>

The service command in June 1943 had planned that Langford Lodge would perform all heavy modification work. But the enormous increase in initial equipment aircraft and in all types of replacement

aircraft, plus the great increase in the number of modifications required, soon made it necessary to allocate some of the work to Burtonwood and Warton. In July the backlog of heavy bombers awaiting modification was so large that the bomber command requested a speed-up that would reduce the time spent at the base depots for modification on B-17's to not more than ten days. But the actual average during the second half of 1943 for heavy bombers was twelve days.<sup>118</sup> Gradually, Burtonwood and Warton took over the main part of modification work, a task destined to become increasingly heavy.

As the intensification of the air battle over Europe led to growing demands for modifications,\* the service command expanded greatly the modification facilities of the base depots. In September 1943 the service command modified 575 aircraft, of which 480 were heavy bombers. Warton, the last of the base depots to get into full operation, began to make its weight felt in January 1944 when the base depots modified over 800 aircraft, more than half of them fighters. As in assembly and repair work, the depots specialized in the modification of particular types of aircraft, Burtonwood handling B-17's, P-38's, and P-47's, Langford Lodge B-17's and P-38's, and Warton B-24's, P-47's, and P-51's. In April 1944 the three depots modified almost 1,400 aircraft and delivered more than 1,700 to forward units.<sup>119</sup> From late 1943 the Ninth Air Force modified many of its own planes, including B-26's, A-20's, C-47's, and fighter aircraft, at its advanced depots.

Many modifications in the fall of 1943 continued to be performed on combat stations, chiefly on initial equipment planes of newly arrived units. The bomber command maintained that during November 1943 its own units had performed modifications on a larger number of heavy bombers than had the base depots. Though this work was done with the help of working parties from the base and strategic air depots, it was hoped that the depots would be able to take over most of it in order to free the combat bases for maintenance and battle damage repair.<sup>120</sup>

Efforts were made to ease the modification burden on the theater by incorporating changes at the time of original manufacture or at modification centers in the United States. For reasons already noted, U.S. modification centers could not hope to keep up with the constantly expanding list of changes desired by the combat groups, but the time

\* The GAF, too, was subject to constant pressure from combat units for modification of aircraft. (See *The Problem of German Air Defence in 1944*, a study prepared by the German Air Historical Branch [8th Abteilung], 5 November 1944, translated by Air Ministry, A.H.B. 6, 3 March 1947.)

lag between requests from the theater and action in the United States was materially reduced. By March 1944 fighter planes incorporating many late modifications began to arrive in the theater. Some feeling existed at AAF Headquarters in 1944 that the extent of modifications performed in the theater impeded the flow of aircraft to combat units, but there seemed to be no escape from the necessity which imposed so much of the job on the theater.<sup>121</sup>

The base depots devoted a large portion of their capacity to the overhaul of engines and propellers. The strategic depots shared with them the repair of accessory equipment, such as parachutes. Engine repairs at a rate averaging well over 500 per month for the second half of 1943 were increased in the early months of 1944 to more than 1,600 engines for April alone. Propeller repairs remained at a steadier figure, ranging from 500 in December 1943 to 550 in April 1944.<sup>122</sup>

The flow of aircraft to the theater in the year preceding D-day kept pace with the flow of units and manpower and produced a many-fold increase in all types of maintenance. The following inventory of aircraft in the theater may serve as a graphic presentation of the growing burden of maintenance work:<sup>123</sup>

<i>1943</i>	<i>Total Aircraft</i>	<i>Combat Aircraft</i>
June	1,841	1,671
July	2,069	1,895
August	2,452	2,275
September	2,827	2,619
October	3,310	3,061
November	4,152	3,835
December	4,618	4,242
<i>1944</i>		
January	5,685	5,133
February	6,917	6,045
March	8,562	7,171
April	9,645	7,875
May	10,637	8,351

Battle damage repair had become probably the greatest concern of the maintenance establishment during 1943.

In this theater perhaps more than in any other [wrote General Eaker at the end of 1943], the maintenance establishment controls the scale of operation. This is due to the high casualty rate caused by the strength of the enemy fighter opposition and the heavy concentrations of defending anti-aircraft. . . . It is normal for from twenty-five to fifty per cent of aircraft on a deep penetration mission into Germany to suffer some form of battle damage. This places a burden on repair establishments which had certainly not been recognized in peacetime planning and for which there was not adequate organization.<sup>124</sup>



Battle damage was primarily a heavy bomber problem. During the second half of 1943 approximately 30 per cent of all bomber sorties resulted in battle damage. Of the 5,330 aircraft which were damaged, 722 received major damage requiring extensive repair work. More than half of the aircraft with major damage returned to combat within ten days, but as many as a quarter of them were still nonoperational after three weeks.<sup>125</sup> In an effort to improve on this record the service command instituted a special training program to remedy deficiencies apparent among engineering officers and noncommissioned personnel assigned to this duty. In particular, it had been found necessary to train sheet-metal workers, for the need had far exceeded the numbers originally allotted. Between 300 and 400 sheet-metal workers were required at each of the strategic depots, whose mobile repair and reclamation squadrons had also to be increased.<sup>126</sup>

The revitalized repair system which was developed by early 1944 was a closely knit yet flexible organization. Battle-damaged planes were divided into four categories depending on the extent of damage, and after appropriate inspection were allocated to the proper echelon for maintenance. The combat units and the subdepots worked closely together on the stations and assisted each other with second- and third-echelon maintenance. Mobile repair units and working parties from the depots assisted in repair work on the stations, especially where combat groups had suffered heavy damage. The strategic depots were responsible for damaged aircraft which landed away from their home bases. The Strategic Air Depot Area kept a close check on all battle-damaged planes and could dispose its facilities quickly to meet changing needs. It became almost unnecessary to call for assistance from the base depots, whose chief contribution to repair work was to serve as supply sources for equipment and spare parts.<sup>127</sup>

A special study for the period 21 January–30 April 1944 demonstrated the degree of efficiency which had been attained. Of the 33,065 heavy bombers which made sorties during the period, 8,859 suffered battle damage. The subdepots, with the assistance of mobile repair units and working parties from the depots, repaired 83.44 per cent of the damaged bombers within five days and almost 50 per cent within twenty-four hours. From this time forward, battle damage repair in the Eighth Air Force became almost a routine maintenance operation, for, in the words of one qualified observer, there were "almost more than enough men, equipment, and accumulated experience."<sup>128</sup>

## CHAPTER 20

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### *POINTBLANK*

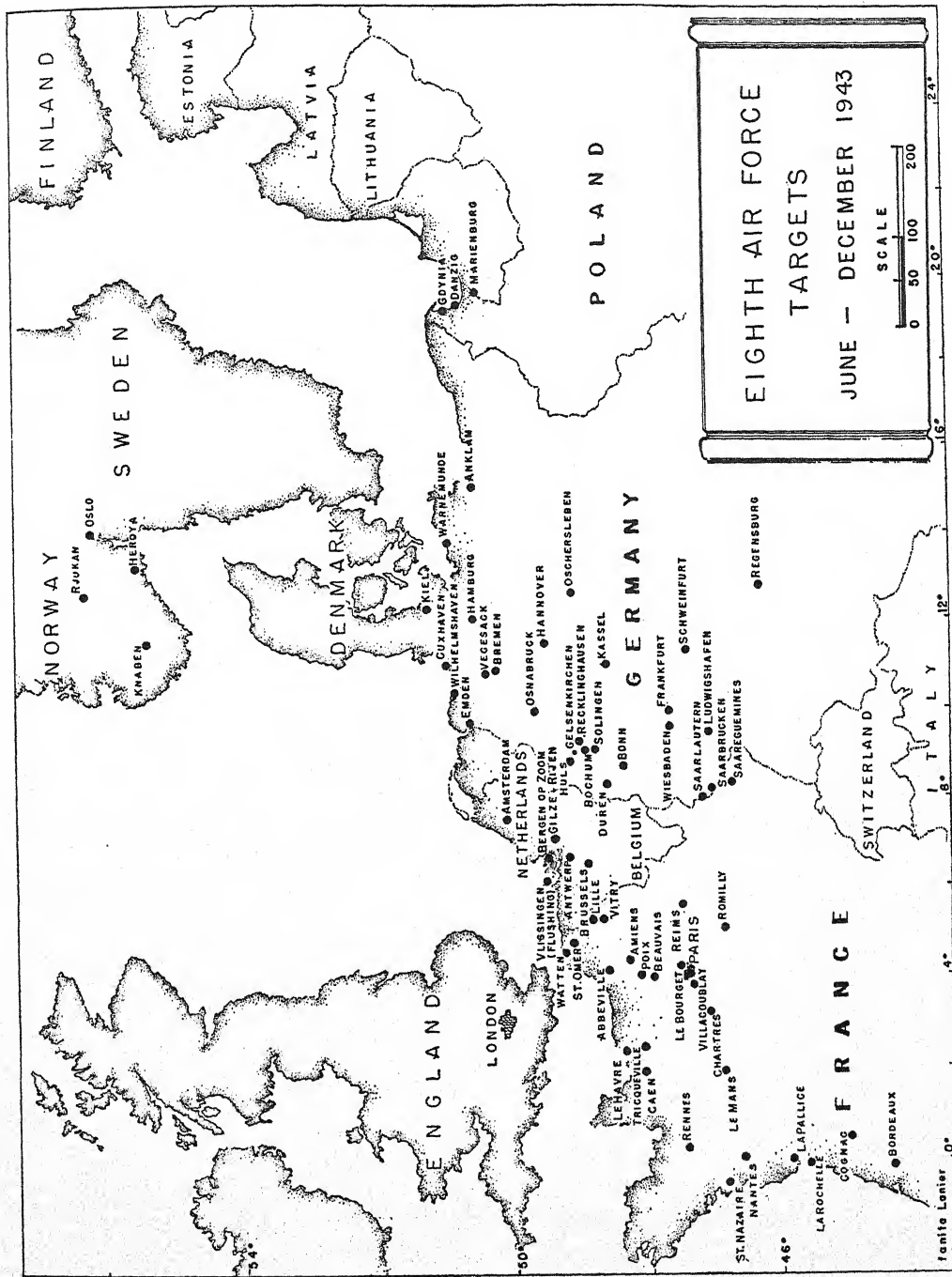
IT WAS in June 1943 that the Combined Bomber Offensive began its official course. Conceived in the early years of the war, authorized at the Casablanca conference in January 1943, and to all intents and purposes a functioning reality (if on a necessarily restricted scale, as far as the American force was concerned) since that date, it did not receive an official directive from the Combined Chiefs of Staff until 10 June 1943. That directive, then, marks the beginning of the CBO. It set forth in general terms the nature and objectives of the campaign which was to prepare the way for the climactic invasion of Europe in May of 1944. It was to be a combined effort on the part of the strategic air forces of the RAF and the USAAF, each operating against the sources of Germany's war power according to its own peculiar capabilities and concepts—the RAF bombing strategic city areas at night, the American force striking particular targets by daylight. June 1943 also marked the beginning of operation by the U.S. Eighth Air Force on a scale large enough to do significant harm to the enemy.

By that date, too, the nature of the task confronting the Allied strategic air forces was becoming clearer. This was especially important for the American force which, because of its doctrine of "precision" bombing, had to have its objectives defined somewhat more exactly than those of the RAF. Since 1941 it had been recognized that before the strategic bombers could concentrate their efforts on the vitals of the enemy's war economy (which was their primary purpose) they would have to penetrate German defenses. Specifically they would have to destroy the Luftwaffe and gain aerial superiority over Europe. But before they could seriously undertake that assignment they had been forced to take a hand in defeating the submarine counteroffensive

which by the spring of 1943 had become an objective of the highest priority for the entire Allied war effort in the west. So it was that the Eighth Air Force during its first ten months of combat operations dropped the greatest part of its meager bomb load on submarine bases and building yards. Submarines remained a top priority target system even in the directive of 10 June. But by the summer of 1943 the submarine menace was already receding, and, what is more, some doubts were beginning to crop up concerning the effectiveness of the antisubmarine bombing campaign.

Consequently from June 1943 to the spring of 1944 the main effort of the Eighth Air Force, and of the combined forces for that matter, was directed against the German Air Force. Referred to in the CBO Plan as an "intermediate priority," even though "second to none in immediate importance," the GAF became a stubbornly increasing threat both to the strategic air offensive and to the ultimate cross-Channel invasion. The CBO as planned in the spring of 1943 was thus primarily a campaign to defeat the Luftwaffe as a prerequisite to OVERLORD; and, ironically enough, it was not until the Allies had gained a firm foothold on the continent (with the immediate and considerable help of the strategic air forces, of course) that the bombing of Germany's vital industries, originally considered the purpose of a strategic bombing offensive, was systematically begun. But that is another story.

Although from June to November 1943 the Eighth Air Force was bringing increasing pressure to bear on the enemy, and although its missions were no longer experimental in the sense that those of the preceding ten months had been, the milestones in the story continued to be those provided by tactical or logistical developments. The pressing questions continued to point less to the damage done the enemy than to the rate of operations and to the ability of the daylight bombing formations to make the necessary penetrations through German defenses into the heart of the Reich. During the summer months little in the way of new answers was forthcoming. The pattern of daylight bombing had been set during the earlier period of experimental operations. By June the German fighter force, which remained the single serious obstacle to daylight bombing, had revealed most of the repertoire of tricks for which it became notorious later in the year—air-to-air bombing, rocket projectiles, fighter-borne cannon, and the tactics of coordinated attacks, all of which had been begun during the late spring of 1943.



During the spring also the American force had worked out most of the basic techniques of defense against these fighter attacks: improvement in firepower (especially in the forward sector), improved defensive formations, better mission planning, and above all improved techniques of fighter escort. The summer months of 1943 saw all these tactical problems intensified. Some, especially that of long-range escort, became acute. But few new problems arose.

Similarly the problems affecting the rate of Eighth Air Force operations remained fairly constant. That organization had two conflicting missions to perform: first, and of course most important, it had to strike the enemy as hard as possible; and second, it had to build up its strength to the point provided in the CBO Plan and considered essential to the success of the strategic bombing program. To accomplish both of these ends was difficult. If the force were conserved in the interests of build-up, the enemy would be granted a much-desired respite from daylight attack. If, on the other hand, the available force were thrown recklessly into the battle, its strength would deteriorate before it had had time to achieve its strategic objective. In addition, weather conditions continued to limit the rate of daylight bombing operations. Here again the problem had been faced in the earlier period. A broader choice of targets had helped somewhat, but hopes were pinned chiefly to the development of radar devices for bombing through overcast. It was not until the end of September, however, that the first radar bombing mission was flown by the Eighth Air Force.

The twin problems of rate and range conditioned the intellectual atmosphere within which the American daylight offensive was conducted for the remainder of 1943, and it is these problems that give meaning to the operations of the period. By October they had both reached a climax which, in turn, helped to bring on a crisis in planning. During the fall of 1943 the entire concept of the CBO was subjected to a re-examination which resulted in a reorganization of the project, if not a redirection of its effort, with a view to the critical and climactic phase immediately preceding the cross-Channel invasion.

### *The Counter-Air Campaign*

By mid-June, then, the Eighth Air Force faced the complicated problem of bombing factories and installations supporting the GAF, with special priority allocated to those within Germany proper, and to accomplish this without long-range fighter escort and with a bomber

force half of which had been operational for barely a month and could therefore hardly be considered experienced. That the situation had changed in no particular since the first of the missions flown by the enlarged force in May was demonstrated on 11 June when, after being frustrated during ten days of bad weather over European targets, the Eighth Air Force dispatched 252 heavy bombers to attack Bremen and Wilhelmshaven. Finding Bremen obscured by clouds, 168 of the bombers attacked Wilhelmshaven and 30 bombed Cuxhaven, a target of opportunity. No fighter support had been provided for the attacking force. The targets lay far beyond the range of available escort; and the route to and from the targets (by this time familiar enough) lay well out to sea around the coast of Holland and northwestern Germany, making it unlikely that enemy fighters would be encountered until the bombers had headed in toward the Wilhelmshaven-Bremen area.<sup>1</sup>

Things went very much as expected, which is not to say that they went well. As on previous AAF missions to those parts, the German fighters appeared in force but reserved their attacks until the bombing formations were committed to the bombing run. Then, when pilots and bombardiers were preoccupied with matters other than evasive tactics and defensive nose fire, the enemy planes converged in coordinated head-on attacks aimed primarily at destroying the aim of the lead bombardiers. During their attacks, the enemy closed to such an extent that at least three collisions were narrowly avoided and one actually occurred, the wing of an FW-190 chopping across the nose of a B-17 as the fighter pilot attempted to roll while passing over the bomber. These attacks seriously impaired the ability of the lead bombardier to bomb accurately, with resulting detriment to the bombing of the entire formation. The lead aircraft had both No. 1 and No. 2 motors knocked out with the result that the plane yawed badly. At the same time the leader of the low group had one motor knocked out, and every plane in the lead squadron of that group had at least one feathered propeller.<sup>2</sup>

Bombing accuracy at Wilhelmshaven was consequently poor, few bombs of the 417 tons dropped did serious damage, and none hit the target (the U-boat building yards). The enemy attacks may be considered, therefore, quite successful. Their score in terms of aircraft destroyed is not so impressive, although they accounted for most of the eight lost by the Americans that day. They appeared content to con-



fuse the bombing run and in the process to force a few bombers to become stragglers, which would render them easy prey to fighter attack.<sup>3</sup>

On the Eighth's next day out, 13 June, the GAF again demonstrated that daylight bombing of targets in Germany beyond the range of Allied escort was likely to be a difficult and costly project. This time, however, events took a different shape. It was the relatively small force from the 4th Wing, attacking Kiel while the main force went to Bremen, that bore the brunt. Of the sixty B-17's that succeeded in bombing Kiel (forty-four attacked the U-boat building yards and sixteen the harbor area), twenty-two were lost as a result of the heaviest fighter attack yet encountered by the Eighth Air Force. The enemy hit them as they neared the German coast, and in force: Me-109's and 110's, cannon-firing FW-190's, even Ju-88's and black-painted night fighters. The attacks were pressed with vigor and tenacity, but the small force of Fortresses fought its way steadily through the swarming enemy until it sighted Kiel. There it delivered its bombs with the battle at its hottest and the lead plane already mortally damaged. In the circumstances it would be churlish to blame them for bombing with less than "precision" accuracy. On the return trip the attacks continued. It was a broken and scattered remnant that landed in England. Claims registered by the returning crews totaled thirty-nine enemy aircraft destroyed, five probably destroyed, and fourteen damaged. It is impossible to estimate the planes destroyed by those bomber crews who were themselves shot down, but considering the intensity of the fighting they must have been numerous. Possibly therefore the claims against enemy fighters may in this instance be closer to the facts than usual. Though hailed by both British and American air commands as a great victory, the "battle of Kiel" can be so considered only in terms of the bravery and determination with which the shattered force of bombers did in fact reach the target and drop its bombs. In terms of the cold statistics which ultimately measure air victories, it was a sobering defeat.<sup>4</sup>

The action of the 4th Wing did, however, clear the way for the main force, 102 strong, which bombed Bremen a few minutes later. This force ran into very slight opposition from enemy fighters. That its bombing was far from accurate, and caused serious damage largely because it was hard to drop bombs in the port area of Bremen without destroying something of military value, may be laid to the inexperience of two of the seven groups participating, to the effective smoke screen employed by the ground defense, and possibly to insufficient famil-

ilarity with the target area on the part of bombardiers and pilots. The few enemy aircraft that intercepted did so half-heartedly, apparently waiting for stragglers crippled by flak. This tactic probably accounts for the four B-17's lost.<sup>5</sup>

On 22 June, Eighth Air Force bombers made the first large-scale penetration of the Ruhr by daylight in a concentrated bombardment of the important synthetic rubber plant at Hüls (Chemische Werke Hüls). Not only was this a significant mission tactically speaking, especially in view of the heavy air fighting experienced during the missions earlier in June, but it was one of the most successful accomplishments to that date from the strategic point of view. The Hüls synthetic rubber plant was one of the finest of its kind in Germany. Built under the auspices of the four-year plan and operated by I. G. Farbenindustrie, it had increased its monthly production by January 1943 to 3,900 tons. The second largest Buna plant operating in Germany (covering an area of 541 acres, of which about 10 per cent was built up), it accounted for about 30 per cent of the country's producing capacity. In addition to tires, the Hüls plant also turned out several chemical by-products of military value. Since 1941, when it had been bombed by the RAF in one fairly heavy and three light raids, it had suffered no major bombing attack until this one of 22 June 1943, when 183 planes of the Eighth Air Force including 11 YB-40's attacked, dropping over 422 tons of bombs, of which 88.6 tons exploded inside the plant area.<sup>6</sup>

So effective was this bombardment that the entire plant was shut down for one month for repairs and full Buna production was not achieved again until six months later.<sup>7</sup> As the plant directors said at the time in a memorandum for the Reich ministry of armaments and war production, "Practically all manufacturing buildings are in difficulty."<sup>8</sup> Total loss in Buna production, according to plant figures, amounted to 12,000 tons, which was enough to reduce Germany's total reserve stocks to approximately one and one-half month's requirements.

In view of the vulnerability of synthetic rubber plants illustrated by this attack, the dependence of Germany on synthetic rubber, and the importance of the Hüls plant in the production of that commodity, it is to be regretted that the Allies did not follow up the bombing of 22 June. For, vulnerable as it was in almost all of its parts, the Hüls plant possessed also a high degree of recuperability and did in time recover completely from the bombing administered in 1943. The attack of 22 June damaged buildings rather than vital equipment, and enough spare

equipment existed to allow some production to be resumed after a relatively short interval. It was the opinion of the USSBS that three to five strong attacks would have effectively eliminated Hüls as a producing plant. To the amazement of German officials (and of USSBS) it received no major attack after 22 June 1943, and in March 1944 it reached peak production.<sup>9</sup> Such was the highly integrated nature of the German chemical industry that the heavy attack on Axis oil, begun in the spring of 1944 by Allied strategic bombing forces, cut down appreciably the production in synthetic rubber plants as well.<sup>10</sup> According to the above-mentioned authority, Allied intelligence miscalculated both the general synthetic rubber situation and the particular situation at Hüls. British MEW reports on the Hüls attack estimated the resulting production losses at more than two-thirds the actual figure—though it would seem that that agency had a reasonably accurate picture of the general weakness of the German synthetic rubber industry.<sup>11</sup>

The Hüls mission took the Germans by surprise. Plans had been laid carefully and cleverly, for this was to be the first large-scale daylight mission into the heart of Germany's industrial area, and the previous missions to targets in the Reich, even though they involved relatively shallow penetration to targets on or near the north coast, had made it clear that such operation would be fiercely opposed. Accordingly a deceptive plan was elaborated. The main force set out along the route, taken many times before on missions to Bremen, Wilhelmshaven, and Kiel, which led well out to sea around the coast of Holland. When just about north of Amsterdam it turned abruptly and headed directly for Hüls. Meanwhile thirty-nine B-17's, constituting a secondary force, were flying toward Antwerp to bomb the Ford and General Motors plants. Also a force of twelve Mitchell bombers of RAF 2 Group, escorted by Spitfires, had carried out a diversionary attack on Rotterdam and had succeeded in engaging the enemy fighters in that area so that they were unable to refuel in time for the heavy bomber attacks. A diversionary flight by twenty-one B-17's of the freshman 100th Group over the North Sea took place too late to be of any help in confusing the German controller.<sup>12</sup>

As it was, that individual appears to have been fairly well confused, though not so thoroughly as the American tacticians had hoped. He seems to have been deceived for a short time by the route taken by the main bomber force, and if the secondary effort had been on time in its bombing at Antwerp, it is very probable that all the fighter forces in

that corner of Germany would have been drawn away from the Hül's area. Even so, the German fighters were split by the two attacks and suffered a great deal from misdirected effort. Nevertheless, enough of them engaged both attacking forces to cause a very lively air battle in which sixteen bombers of the main force and four of the secondary were shot down, mostly by enemy fighters which employed all the tricks then in common use, including aerial bombing, formation attacks, and large-bore cannon fire. This loss, amounting almost to 10 per cent of the bombers attacking, was balanced by enemy losses which must have been high even when allowing for the inevitably inflated nature of the claims registered. Losses to the bombers would have been even greater if effective withdrawal support had not been provided by twenty-three squadrons of Spitfires and three squadrons of Typhoons from the RAF and by eight squadrons of American P-47's.<sup>13</sup>

As for the Germans at Hül's itself, they were taken completely unawares. The flak headquarters did not report danger to the plant air raid warden until the bombing had almost begun. The alarm thus practically coincided with the attack. It was a rude shock for the workers at the plant. They had become one of the most thoroughly regimented and smoothly functioning production teams in German industry and they felt reasonably secure from attack. Night attacks had apparently been abandoned, and daylight bombing had as yet been confined mainly to coastal areas. Furthermore, the workers seem to have had confidence in the Luftwaffe's capacity to put up an effective defense. On that bright June morning the Germans crowded into the streets to watch the large formation of planes approaching at very high altitude—obviously a German force, for no alarm had sounded and no guns were in action. Within ten minutes 186 people were killed and 1,000 wounded. Bombs cracked the walls of two air raid shelters and killed 90 people inside them. For days the community was in disorder, panic had seized the German workers, and the foreign workers had gotten out of hand.<sup>14</sup>

Weather conditions during the remainder of June 1943 made further missions over Germany impracticable. In fact they frustrated three attacks launched against aircraft factories, airfields, and submarine installations in France. Except for another heavy blow against the port of St. Nazaire, now famous for its ability to function as a base for submarines despite some of the heaviest and most consistent bombing ever administered to a single target, the American bombing force attempted

no major bombardment. During the first half of July it continued to concentrate upon targets in France of importance to the Luftwaffe, with one attack of medium weight against the U-boat base at La Pallice. Of these attacks two, against the S.N.C.A. de l'Ouest aircraft factory at Nantes on 4 July and against aircraft factories at Villacoublay and Le Bourget on 14 July, were outstanding. At the former a bombing force of 61 planes dropped 145 tons of bombs on the factory area, scoring 18 direct hits from 25,000 feet on the target—a building only 650 feet square. This remarkable example of "pickle-barrel" bombing of a small and isolated target was all the more interesting because with the rapid expansion of the bomber force during the previous weeks had come a certain deterioration in bombing accuracy. At Le Bourget and Villacoublay the bombing, if less spectacular than at Nantes, was nonetheless very effective.<sup>15</sup>

These missions to targets in France provided temporary, and doubtless welcome, relief from the heavy air fighting the bomber force had encountered over Germany, and this despite enemy reaction on a large scale. All of the missions had fighter escort, and many enjoyed protection the entire way to and from the target. It was becoming constantly clearer that excessive losses to the bomber force could only be avoided by extending the use of fighter escort. Other tactics were more or less effective, of course, and during these missions of late June and early July good use was made of diversionary feints and simultaneous attacks calculated to split up the enemy fighter force. A few YB-40's, B-17's modified for duty as flying destroyers, now flew regularly with the bomber formations, but their value was dubious.

During the last week of July 1943, the Combined Bomber Offensive, and especially the part played in it by the Eighth Air Force, reached something of a climax. Murky weather, which had closed in north-western Europe for most of the past three months, suddenly cleared and allowed both AAF and RAF bombers to unleash the heaviest and most continuous attacks in the history of aerial warfare to that date. Almost nightly RAF raids set new records in tonnage dropped. American heavy bombers operated on six days from 24 to 30 July in a series of missions without precedent in daylight bombing for range of targets, depth of penetration, weight of bombs dropped, number of sorties, and destruction to German war potential. In addition, the American force inaugurated during this week a whole series of new tactics.<sup>16</sup>

On 24 July the Eighth Air Force bombed objectives in Norway for

the first time. Targets for the day were the new (as yet unfinished) magnesium, aluminum, and nitrate works of Nordisk Lettmetal at Heroya and U-boat and other harbor installations at Bergen and Trondheim. A force of 167 bombers dropped 414.25 tons of bombs at Heroya, the most important target. Bergen was found to be completely obscured by cloud, and in accordance with the accepted policy barring indiscriminate bombing over occupied countries, the 84 planes sent there made no attempt to bomb; 41 bombers were, however, able to drop 79 tons of bombs at Trondheim. The flight to Bergen and Trondheim, being the longest hitherto attempted by American bombers based in England,\* was assigned to the 4th Bombardment Wing, which was by this time completely equipped with the long-range fuel tanks (used for the first time on 28 June). The crews had been briefed on emergency landing fields in Scotland and northern England for aircraft unable to complete the return flight, but happily all planes were able to return without difficulty to their home bases. In order to conserve fuel the route to and from the targets for both forces had been planned and flown at low altitude, the climb to bombing height starting at the Norwegian coast.<sup>17</sup>

Anticipating relatively weak defenses, the attackers executed their bombing run at lower altitudes than usual in that theater. At Heroya they bombed from an average altitude of 16,000 feet, at Trondheim from 19,000 to 20,000 feet. Even so, Allied intelligence had overestimated the strength of the local defenses. Enemy reaction was generally slight, with the result that only one of the 309 planes dispatched that day failed to return, and its crew succeeded in landing it safely in Sweden after it had been damaged by flak.<sup>18</sup> In the case of Heroya, it is possible that bombing could have been accomplished at lower altitudes, and therefore more effectively, for the target plants were almost completely lacking in protection.<sup>19</sup>

The bombing done at Heroya was by no means bad. In fact it was more accurate than indicated by subsequent photographic interpretation: instead of 230 bombs bursting within the target area and 50 direct hits, actual figures proved on later investigation to be 580 bursting within the area and 151 direct hits. The resulting damage disrupted the work at the nitrate plant for three and one-half months. After the bombing of 24 July the Germans abandoned the still unfinished alumi-

\* The mission to Trondheim involved a round-trip flight of 1,900 miles, those to Bergen and Heroya 1,200.



num and magnesium plants, a fact which Allied intelligence missed largely because routine boarding up of damaged walls and roofs was mistaken in photo interpretation for a fairly advanced stage of repair and reconstruction. The bombing of Heroya thus cost the enemy a matter of 12,000 tons of primary aluminum, or 30 per cent of all such loss resulting from direct attacks after midsummer of 1943. However, the bombardment of aluminum production has since been found to have had little effect on the ability of Germany to wage war; indirect attacks, by way of electrical power and transportation, proved in the long run more effective than direct bombings in slowing down production in this industry. It should also be noted that bomb damage alone (estimated by a USSBS analyst at 15 to 20 per cent) did not induce the Germans to abandon the Heroya plants. German plans for producing aluminum in Norway had been extensive, but it appears that by the summer of 1943 the aluminum situation in Germany was no longer so critical as when the Heroya plant was conceived, and the cost of protecting Heroya from almost certain attacks in the future outweighed the advantage to be gained from further operation of the factories.<sup>20</sup>

Bombing at Trondheim was described by Norwegian eyewitnesses as having been carried out "with impressive accuracy." It caused very severe damage in the port area; and despite some loss of civilian life and property, it seems to have greatly bolstered Norwegian morale. Most of the loss of life, which was considerable, occurred among the German soldiers and the workers in the Todt organization. The local Nazi-controlled newspapers the following day described the raid as an American terror attack against civilians, one which had resulted in great loss of Norwegian life but only slight damage to military objectives.<sup>21</sup>

The Heroya-Trondheim mission became the occasion for an experiment in assembly procedure which was to have an important bearing on the rate of Eighth Air Force operations. The problem of assembling a force of heavy bombers into a combat formation was not an easy one, even by daylight on a clear day. Heavy bomber airfields were concentrated in East Anglia, with one group allocated to one field. Under these congested conditions, a group assembly and the assembly of several groups into the combat wing formation presented serious difficulties in traffic control. Heretofore, weather had hampered daylight operations not only by obscuring target areas but by creating condi-

tions over the base areas which made it impossible for a heavy bomber force to assemble. The need for some procedure for assembling the combat formations above the overcast at times when cloud conditions were such as to prevent ascent in formation had been recognized for some time. On the Heroya-Trondheim mission individual aircraft took off on instruments and proceeded to designated splashers beacons for group formation and then along a line of three splashers beacons for force assembly. The method worked very well and made possible the successful accomplishment of many missions which might otherwise have been abandoned.<sup>22</sup>

Next day, 25 July 1943, the force of B-17's bombed U-boat construction yards at Hamburg through the smoke still rising from the first of the RAF's "Katastrophe" raids on that city, while another bomber force again struck the submarine installations at Kiel. In all, 323 American bombers were dispatched that day and 218 attacked German coastal targets, but it was costly going. Despite diversionary missions by USAAF medium bombers (now assigned to the VIII Air Support Command) and RAF light bombers to targets in north Holland and northwestern France, carefully planned to coincide with the approach of the heavy forces and thus to prevent enemy fighters in those areas from reinforcing the defenses of the Kiel-Hamburg area, 19 B-17's failed to return. Most of them fell victim to increasingly effective formation attacks by the German fighters, although five of the losses resulted from antiaircraft fire at times both intense and accurate.<sup>23</sup>

On the following day, VIII Bomber Command dispatched over 300 B-17's, again to objectives in northwestern Germany. Of the 199 that succeeded in bombing, 92 attacked the rubber plant at Hannover, 54 dealt another blow at the submarine yards at Hamburg, and 53 bombed targets of opportunity. Again small diversionary raids were undertaken by B-26's of VIII Air Support Command and by RAF Bostons and Typhoons against near-by airdromes. But again the bombers, unescorted except for 3 YB-40's, suffered heavily from fighter and flak attack, losing in all 24 of their number, at least 13 to enemy aircraft, 7 to antiaircraft, and 4 to causes unknown.

Results, however, were good at both main targets. At Hannover especially, the 208.85 tons of high explosives and incendiaries dropped on the two factories of Continental Gummi-Werke proved seriously, if temporarily, embarrassing to the enemy. As in the case of the bombing of the rubber plant at Hüls a month earlier, Allied intelligence, not

usually given to underestimating the results of bombing, was decidedly conservative in its evaluation of the Hannover mission. It estimated a reduction in capacity of between one-sixth and one-third in the mixing and tire-assembly stages, whereas plant production records for the following month indicate a drop in total plant output of 24.5 per cent. Intelligence reported an estimated loss of 2,000 aircraft tires and 6,000 truck tires. Production records for the month following the raid show a decrease of 3,400 aircraft and 13,000 motor vehicle tires. Recovery was rapid, however, and it was not until March 1945, despite intermittent attacks, that the plant was knocked completely out of action.<sup>24</sup>

On 28 July relatively small forces of VIII Bomber Command made the deepest penetrations hitherto accomplished by the American bombers. Altogether, 302 of the heavy bombers were dispatched in two forces, but adverse weather prevented the majority from completing the mission. One group out of a force of 120 equipped with long-range tanks, after executing a feint in the direction of the much-bombed coastal targets in the Hamburg-Kiel area, pushed inland toward Oschersleben, 90 miles south-southwest of Berlin, where 28 of them succeeded in bombing the AGO Flugzeugwerk, a major producer of the redoubtable FW-190's. For a while it looked very much as though, after fighting its way into the heart of the Reich, the attacking force would be unable to see its target. But through a small hole in the 9/10 cloud that lay over Oschersleben the lead bombardier recognized a crossroad a few miles from the aiming point. Making his calculations quickly, he let his bombs go on the estimated time of arrival. Reconnaissance photos taken the following day showed an excellent concentration of hits on the target. The British Ministry of Home Security estimated that this attack, though relatively light (67.90 tons), resulted in four weeks' loss of production in the important Focke-Wulf plant. Other bombers achieved only fair results at Kassel.<sup>25</sup>

The day's operations cost 22 B-17's and their crews, the heaviest loss having been suffered by the force sent to Oschersleben which lost 15 out of the 39 that completed the mission by bombing either the designated target or targets of opportunity. The enemy as usual employed every device at his command, including aerial bombs, large-bore cannon, and rockets. It was in this engagement that he scored his first real success with the latter, already recognized as the most threatening of the new fighter devices. One B-17 received a direct hit from a rocket and crashed into two others, causing the destruction of all three. An-

other returned with a gaping hole in its fuselage made by a rocket.<sup>26</sup> Claims registered by the bomber crews bear eloquent witness to the intensity of the air fighting if not to the actual attrition suffered by the Luftwaffe: the Oschersleben force alone claimed 56 enemy aircraft destroyed, 19 probably destroyed, and 41 damaged; the total for the day's fighting ran to 83/34/63.<sup>27</sup>

Bomber losses would have been even greater if it had not been that on that day the P-47's of VIII Fighter Command traveled farther in support of the bombers than they had ever done before. Equipped for the first time with jettisonable belly tanks, 105 P-47's met the returning bombers about 260 miles from the English coast and escorted them safely home. Their appearance at a point over 30 miles deeper in Germany than they had been going hitherto, even at their extreme limit of range, caught about 60 German fighters by surprise while they were busily engaged in picking off crippled B-17's that had been forced to drop out of formation. In the ensuing mêlée the Thunderbolts shot down nine of their adversaries and drove the rest away. One P-47 failed to return.<sup>28</sup>

The first use of jettisonable tanks climaxed nearly ten months of negotiation and experiment for the development of expendable tanks. Some of the delay had resulted from problems of production and procurement in wartime and is discussed in another chapter of the present volume.\*<sup>29</sup> There seems, however, to have been some doubt about the feasibility of developing a truly long-range fighter. All observers agreed that such a plane would be desirable, but British authorities on the subject and some Americans (and certainly the Germans) believed the project impossible. Tanks of course would help, but they could not, it was believed, be used over enemy territory since they would seriously reduce the speed and mobility of the plane in combat areas. Their help would therefore be slight. But among most American air planners it had been assumed since the early days of the Eighth that the daylight bomber offensive depended on the availability of fighter escort, extended if necessary by the use of auxiliary tanks.†<sup>30</sup> For a while in late 1942 and early 1943 some Eighth Air Force officers professed to be confident that the American heavy bombers could fight their way through German fighter opposition.‡ But their hopes died out as the missions over German soil, begun early in 1943, began to run into stiff resistance; and as the spring and summer campaigns progressed, it be-

\* See above, pp. 654-55.

† See above, pp. 229-30.

‡ See above, p. 334.

came increasingly evident that some sort of escort would be required if daylight strategic bombing were to continue as a successful undertaking.

Meanwhile, the YB-40 had proved disappointing. A few of the planes had been used on most missions since their arrival in May, but they had done little to increase the defensive power of the heavy bomber formation. Being heavily armored and loaded they could not climb or keep speed with the standard B-17, a fact which merely resulted in the disorganization of the formation they were supposed to protect. Nor did their score in terms of enemy aircraft shot down justify their use. For a while it was hoped that the YB-40 might fall out of formation to protect stragglers, but even with its increased firepower (20 per cent greater than that of the B-17), it was too vulnerable to concentrated attack by enemy aircraft to warrant its use in this manner.<sup>31</sup> Although, at General Eaker's request, production of YB-40's ceased and models already completed were re-equipped as bombers, hope was not entirely abandoned of developing a suitable destroyer plane.<sup>32</sup> So concerned was General Arnold's headquarters to find some such expedient to make up for the failure of the YB-40 that in July 1943 it suggested using medium bombers (the B-26's already functioning in the United Kingdom) as escort for the heavies. The proposal was received with some concern in Eighth Air Force headquarters. Not only was the B-26 unsuited in range and performance characteristics to fly with B-17's but it was fully as vulnerable in the face of enemy aircraft attack as were the heavy bombers. The mediums were, moreover, being profitably employed against enemy airdromes and on diversionary missions in support of the heavy force.<sup>33</sup>

No alternative remained, then, but to increase the range of available fighters (which at the time meant the P-47's) and to develop the fighter force primarily for the purpose of protecting bombers, even if that meant limiting it as an offensive arm operating independently against the Luftwaffe.<sup>34</sup> For the mission of 28 July 1943 the P-47's were equipped with makeshift 205-gallon paper tanks (loaded to only half capacity) which were not suitably pressurized for use above 22,000 feet and which seriously interfered with the aircrafts' speed. The plan was to use these tanks merely to enable the fighters to cross the Channel and reach an altitude of 22,000 feet and to jettison them before entering enemy territory. The increase in range was therefore slight. On 17 August 1943 tests were made of pressurized 75-gallon tanks which

could be carried until empty or until the enemy was encountered. Used in combat operations during the latter part of the month, they extended the range of fighter escort to 340 miles. Thus a beginning, but a beginning only, had been made toward solving the critical problem of long-range escort.<sup>35</sup>

After a carefully planned and skillfully executed mission on 29 July to the U-boat building yards at Kiel and the Heinkel aircraft factory at Warnemünde, the heavy bombers on 30 July concluded their week of record activity by returning to Kassel to bomb the Fiesler aircraft components and assembly plants. As on 28 July, they were forced to fly deep into enemy territory. This time, however, they took less of a beating. Of the 186 bombers dispatched, 134 succeeded in reaching the target, which they bombed at a total cost of 12 B-17's. Again the P-47's gave withdrawal support, rendezvousing with the bomber force at Bocholt, Germany, just beyond the Dutch border; and, as on the 28th, they were able to surprise the enemy fighter force, which had not yet become accustomed to fighter penetrations beyond the coastal fringe. The P-47's, it would appear, took even more of the burden of defense than on their previous deep penetration, when the German fighters had been engaged over a longer period prior to the appearance of the withdrawal escort. This time the six squadrons of P-47's equipped with auxiliary tanks saw brisk action, losing seven and claiming twenty-five of the enemy, with four held probable.<sup>36</sup> Bombing was fairly accurate and, according to German records, caused damage of 10 per cent, 20 per cent, and 5 per cent respectively to the three plants involved.<sup>37</sup>

### *Regensburg-Schweinfurt*

Fine bombing weather prevailed during most of the week following 30 July 1943, but crews of the VIII Bomber Command and all other outfits, medium bomber and fighter, American and British, that had contributed to the previous week of strenuous operations, were exhausted. In effective strength the VIII Bomber Command was down to 275 heavy bombers.<sup>38</sup> The inability of the Allied air forces to follow up this offensive pointed more imperatively than ever to the need for a larger operating force, both in bombers and escort fighters.<sup>39</sup> But it had been a remarkable offensive, even so, and drew congratulation from Air Chief Marshal Portal. It had extended the range and weight of the daylight bombing significantly (50 per cent more bombs were dropped in July than in June by the American heavy bombers), and



targets deep in the Reich had been repeatedly and successfully attacked. Of special import were the attacks on the German aircraft industry. On three successive days the B-17's bombed Focke-Wulf plants at Oschersleben, Warnemünde, and Kassel. They were not decisive attacks; they did not cripple the three factories; but they were embarrassing enough to the enemy to cause him to speed up the dispersal of his fighter aircraft industry, and they were among those missions of 1943 which, if they did not seriously reduce the flow of fighter aircraft, at least took up the slack in that industry and thus left it vulnerable to the devastating attacks of 1944.<sup>40</sup>

The cost, of course, had been high. In six operations from 24 July to 30 July, inclusive, the heavy bomber force lost 88 aircraft—8.5 per cent of those listed as attacking, or a trifle less than 5.3 per cent of the planes dispatched. If the singularly fortunate mission to Norway of 24 July is excepted, the figures for the rest of the attacks—all against targets in Germany—become even worse. Although not prohibitive in view of the strategic importance of the operations, these losses were seriously embarrassing to a force committed to rapid growth as well as to a maximum offensive.<sup>41</sup> And with targets still deeper in enemy territory yet to be bombed, the Eighth Air Force looked forward to its August operations with modified optimism. That the cost had not been overestimated was indicated when the Eighth Air Force resumed operations on 12 August. In the course of a four-pronged raid against targets in the Ruhr, the attacking force, totaling 243, lost 25 aircraft.

But it was on 17 August that the daylight bombers engaged in their greatest—and from the point of view of loss their most disastrous—air battle to date. After two days of action against airdromes in occupied territory, accomplished to a large extent under the beneficent eye of the P-47 and Spitfire escort,<sup>42</sup> they celebrated the first anniversary of American heavy bomber operations in the United Kingdom by attacking the two most critical targets on their list, the antifriction-bearing plants at Schweinfurt\* and the large Messerschmitt aircraft complex at Regensburg.<sup>43</sup>

This double mission marks the high point of the summer in the daylight bombing campaign. It involved the deepest penetrations over German territory to date. The force (376 B-17's) was the largest thus far dispatched by the Eighth Air Force and reflects the steady growth of that organization. More bombers attacked than ever before (315),

\* In July 1943 they produced half the bearings manufactured in Germany.

and they dropped an unprecedented bomb load of 724 tons. In terms of the destruction wrought, it was one of the most important of the year. As for the air battle, it was also without parallel. The Regensburg force lost 36, the Schweinfurt force lost 24, making a total of 60 heavy bombers shot down during the day—which is to say 16 per cent of the bombers dispatched or 19 per cent of those that attacked. The total claims against enemy aircraft, 288 destroyed, though certainly too high, indicate at least the terrific intensity of the air fighting.<sup>44</sup>

The Regensburg-Schweinfurt mission also had its origins in an initial effort to coordinate plans for strategic air operations from the United Kingdom and the Mediterranean. Since early 1943 the project for a decisive bombing of the oil refineries at Ploesti in Rumania (TIDALWAVE) had been taking shape.<sup>45</sup> Three B-24 groups had been detached from the Eighth Air Force for service with the Ninth Air Force in Africa to supplement the two groups of B-24's belonging to that organization. The movement was completed by 9 July 1943.<sup>46</sup> But the attack on the oil refineries was not the only project of this sort the Allied planners had in mind. The other, bearing the code name of JUGGLER, involved a long-range attack against the big Messerschmitt complexes at Regensburg and Wiener Neustadt (in Austria), then being credited together with producing 48 per cent of all German single-engine fighters.<sup>47</sup> JUGGLER was to be a coordinated attack—the first of its kind—involving simultaneous assaults on the part of both the Eighth and Ninth Air Forces and launched from bases in both Africa and the United Kingdom. It was reasoned that neither objective was aware of its vulnerability and that an attack against the one should coincide with an attack on the other so that the defenses at both locations would be taken by surprise. Since General Eaker did not have a large enough force of B-17's equipped with long-range tanks to attack both, he proposed that the Ninth Air Force undertake the Wiener Neustadt mission as the one more difficult to accomplish from the United Kingdom.<sup>48</sup> Portal, Eisenhower, Tedder, and Spaatz, among others, felt that JUGGLER should take precedence over TIDALWAVE, on the ground that the latter would entail greater losses than the former and, in order to bring maximum pressure to bear on both attacks, the one with the less prospect of loss should be attempted first. But both Marshall and Arnold had great confidence in the Ploesti project, and by 23 July 1943 the CCS had decided that it

\* See above, pp. 477-79.

should precede the attack on the fighter factories. JUGGLER was to take place as soon thereafter as the TIDALWAVE force could make repairs and rest its crews.<sup>49</sup>

Ploesti was bombed on 1 August 1943.\* JUGGLER was then set for 7 August. But weather conditions over northwestern Europe interfered with the projected assault by the Eighth against Regensburg. After several postponements the idea of a coordinated attack was abandoned, and the decision made to allow either force to stage its mission as soon as conditions proved favorable. The attack on Wiener Neustadt followed on 13 August.† The bombers failed to paralyze the factories and, indeed, to damage seriously the most important plant in the complex, but they caused enough destruction in the plant engaged in fuselage construction, assembly, and flight testing to reduce total production of single-engine fighter aircraft at Wiener-Neustaedter Flugzeugwerke A.G. from 270 in July 1943 to 184 in August. By October of that year the output was still only 218. It was the first of a series of attacks which, during the remainder of 1943, forced the complex to undertake extensive and costly dispersal.<sup>50</sup>

Meanwhile the Allied planners in the United Kingdom had evolved a plan for a simultaneous assault against both the Messerschmitt complex at Regensburg and the antifriction-bearing industry at Schweinfurt. The 3d Bombardment Division (heretofore referred to as 4th Bombardment Wing),‡ equipped with long-range tanks, was to bomb Regensburg and then continue on an unprecedented flight to advanced bases in North Africa. The 1st Bombardment Division (1st Bombardment Wing), which was to be dispatched to Schweinfurt, was more limited in its range and was to return to the United Kingdom bases over the reciprocal of its route to the target. Because of the great distances to be covered, neither force could greatly vary its course. Weather forecasts on 16 August for the first time in weeks favoring both the deep penetration into southern Germany and the subsequent flight to African bases, the decision was made to launch the double-barreled mission on the following morning. Crews of the 3d Division were told to pack their toothbrushes and a change of underwear and were left to their own speculations as through the night operational commanders studied

\* See above, pp. 479-83.

† See above, p. 483.

‡ Although the bombardment divisions were not officially established until September, the designations were used informally for several months preceding. See above, p. 645.

the weather forecasts. By morning, despite very unfavorable weather in the base areas, they concluded that the time had come for the big mission. Conditions along the entire route as well as over the targets were the best that had been forecast for two weeks past, and the critical importance of the objectives seemed to justify any risk involved.<sup>51</sup>

Originally it had been planned to send the Schweinfurt force out just ten minutes after the Regensburg force had crossed the enemy coast. Most of the fighter support was assigned to the latter in the hope that it would engage the bulk of the enemy fighters. Especially bad weather over 1st Division bases delayed the Schweinfurt force in its take-off and assembly, and since the Regensburg bombers must land at the African bases before dusk, no delay in their dispatch beyond an hour could be permitted. Consequently, it was hastily arranged to hold the Schweinfurt task force for three and one-half hours after the Regensburg force had departed in order that the fighter protection accorded the latter might have time to land, refuel, and take to the air in support of the former. It was well understood that the projected mission would precipitate a large-scale air battle. Accordingly, eighteen squadrons of Thunderbolts from the VIII Fighter Command (as many as possible equipped with the still-scarce belly tanks) and sixteen squadrons of RAF Spitfires were to provide cover to the extent of their range as the bombers went in and returned. In addition, B-26's of VIII Air Support Command and RAF Typhoon bombers were to bomb airfields in France and the Low Countries in order to pin down German fighters in those areas.<sup>52</sup>

Except for some miscalculation on the part of a small number of the escorting fighters, the double mission proceeded as planned. Enemy resistance more than justified the most sober predictions. Both forces ran into almost continuous fighter opposition, pressed home with the utmost intensity and accounting for the great majority of bombers lost. Scarcely did one group of enemy fighters withdraw before another took its place. The Luftwaffe unleashed every trick and device in its repertoire. The Me-109's and FW-190's attacked from all directions, singly and in groups. In some instances entire squadrons attacked in "javelin up" formation, which made evasive action on the part of the bombers extremely difficult. In others, three and four enemy aircraft came on abreast, attacking simultaneously. Occasionally the enemy resorted to vertical attacks from above, driving straight down at the bombers with fire concentrated on the general vicinity of the top tur-

ret, a tactic which proved effective. Some enemy fighters fired cannon and some rockets. Even parachute bombs were employed in a desperate effort to stop the bomber formations as they droned on toward their targets. Both AAF forces suffered in roughly the same proportion. It is probable that the Regensburg groups might have lost even more heavily in the air battle had they returned to their English bases, for they appear to have taken the Luftwaffe by surprise when they continued on toward the Mediterranean. It was the most intensive air battle as yet experienced by the American daylight bombing force, and certainly one of the worst in the memory of the Germans. For the hard-hit Americans there was a certain comfort in one of the last phrases picked up by radio interception. After increasingly excited claims of strikes and kills, mingled with cries of "Parachute" and "Ho, down you go, you dog," came a final gasp, "Herr Gott Sakramant."<sup>53</sup>

Despite the ferocity of the air battle, which extended all the way to the targets, the bombers did an extremely good job. This was especially true at Regensburg, where they blanketed the entire area with high explosives and incendiary bombs, damaging every important building in the plant and destroying a number of finished single-engine fighters on the field.<sup>54</sup> At Schweinfurt the bombers operated with less impressive accuracy, but not without effect. Plant records indicate 80 high-explosive hits on the two main bearing plants. As far as production was concerned, the results were most significant at Kugelfischer, where 663 machines were destroyed or damaged. Losses in the ball department were especially serious, where production dropped from 140 tons in July to 69 in August and 50 in September. An increase in output did not become apparent until November 1943. After this first attack on the bearing industry, the Germans began to investigate the possibilities of substituting for high-quality or scarce bearings those of simpler types or in good supply and to seek additional sources of finished stock in Sweden and Switzerland. This policy made it possible for the Germans to avoid the dire consequences that would ordinarily follow heavy and accurate bombing of a highly concentrated industry. They at no time during the war were seriously embarrassed by a lack of anti-friction bearings. One of the most significant results of the Allied bombing of 1943 was to force the Germans to reorganize their industries, in the course of which they lost as much production as from the direct impact of the early bombing but were able to place themselves in a more favorable position with regard to further bombing.<sup>55</sup>

On one point the operations of 17 August had been disappointing. General Arnold, among others, had hoped that the flight of the Regensburg force to bases in North Africa would inaugurate regular shuttle bombing which would capitalize on the generally finer weather prevailing in the Mediterranean area and on the confusion into which the maneuver was expected to plunge the enemy fighter control. But Col. Curtis E. LeMay, who had preceded the 3d Division planes to Africa in order to arrange for necessary maintenance and base facilities, reported unfavorably on the experiment. As he pointed out, it was difficult to operate heavy bombers without their ground crews, especially if maintenance and base facilities were insufficient, as in Africa, where the changing nature of operations demanded that the supplies and equipment be constantly moved. Moreover, landing away from their bases put an additional strain on combat crews and affected their efficiency adversely.<sup>56</sup>

Not until 6 September did the Eighth again attempt a mission on the scale of the Regensburg-Schweinfurt operation. Meanwhile, it resumed the simpler task of bombing airdromes and airplane factories in France, Belgium, and Holland. With friendly fighter escort for most of the time, the heavy bombers flew during this three-week period some 632 credit sorties at a loss rate of barely 4 per cent. And frequently they were very effective, especially on 24 August when the bombing force followed up its successful attack of 14 July against the Focke-Wulf workshop at Villacoublay and on 31 August and 3 September when it severely damaged airdromes at Amiens and Romilly-sur-Seine. On 27 August it attacked an "aeronautical facilities station" (later identified as a large rocket-launching site) at Watten. Because of the small size of the target, bombing was done by smaller units than usual (under heavy fighter escort) and at as low an altitude as 14,000 feet. The fact that the attack failed to disturb the massive concrete of the rocket site was not the result of inaccuracy.<sup>57</sup>

On 6 September 1943 the Eighth Air Force set a new record in the number of heavy bombers dispatched. By that time the three B-24 groups which had been operating with the North Africa-based forces of the AAF had returned to England. By that date, too, the B-17 force had increased from its June strength of 13 groups to a total of 16¾ groups. Much of the assigned strength, however, was not at this point fully operational. For the month of September 1943 the Eighth reported a daily average effective strength for combat purposes of only



373 heavy bombers and crews. It was therefore an event of some importance when on 6 September it dispatched 407 bombers. Of this total, 69 B-24's were sent on a diversionary sweep over North Sea areas; the remainder of the force had been assigned a mission to bomb aircraft and bearing factories in and around Stuttgart. Although weather frustrated this purpose, 262 of the bombers succeeded in bombing targets of opportunity. But again, as in most previous penetrations of German territory, the losses were high—this time reaching 45 aircraft and crews.<sup>58</sup> As if to emphasize once again the importance of long-range escort, the Eighth sent out, on the day following, a force to attack aircraft facilities in Belgium and Holland and the rocket site at Watten in France. Thanks to excellent fighter support, 185 planes bombed without a single loss—indeed, without experiencing a single encounter with enemy aircraft.<sup>59</sup>

The American heavy bombers became involved more or less directly in Operation STARKEY during the latter days of August and the first nine days of September. Designed in part to contain enemy forces in the west and so to prevent them from being transferred to the Russian front, the operation was also intended to serve as a dress rehearsal in the Pas de Calais area for the invasion of western Europe and to provoke the Luftwaffe into a prolonged air battle calculated to prove more costly to it than to the Allied air forces. Accordingly, from 16 August to D-day (initially set for 8 September but changed to the 9th because of unfavorable weather) no pains were spared to stage a heavy air attack and to create the illusion of an impending major amphibious assault.<sup>60</sup>

For STARKEY the Allied air forces were placed under the control of RAF Fighter Command.<sup>61</sup> In addition to requiring almost the entire effort of the medium bombers and fighters belonging to the Eighth Air Force, the plan initially called for a very extensive effort on the part of the heavy bombers—amounting in all to some 3,000 sorties. At the urgent request of Generals Devers and Eaker, however, this diversion (for it was clearly a diversion from the main objective of the daylight bombing force, which was to strike strategic objectives, and preferably in Germany proper) was scaled down to only 300 sorties to be performed in support of STARKEY by “freshman” crews just becoming operational in the United Kingdom. Moreover, the American fighter force was to continue to support the daylight bombers as its primary duty. If, however, weather conditions during the air phase of the oper-

ation were to prevent bombing of German objectives, then the entire force of VIII Bomber Command would be employed against aircraft factory installations back of the Pas de Calais area, the destruction of which would contribute both to POINTBLANK and to STARKEY.<sup>62</sup>

On five occasions between 25 August (the starting date for the "preparatory phase") and 9 September the American heavies attacked targets of importance to the GAF. With the exception of the action on the 8th, in which a force of B-17's (five in number) participated for the first time with RAF bombers in a night raid, these missions were mounted in considerable force. And on the 9th, D-day, the Eighth Air Force dispatched 377 bombers, of which a record 330 made effective sorties. But the number of these missions, more or less in support of STARKEY, was dictated to a large extent by the weather which during most of the period made operations over the Reich impossible and which, in fact, defeated the only attempt made in that direction—the attack against Stuttgart on 6 September.<sup>63</sup>

Since STARKEY turned out to be a very disappointing operation, it is just as well that it cost the strategic bombing forces little in diverted effort. The Germans failed to react as briskly as expected. Clearly they had not been deceived and clearly also they were determined not to risk their precious fighter defenses in an air battle in which they were outnumbered and which was not likely to be of decisive importance.<sup>64</sup>

### *Radar Bombing*

During the month of September there were eighteen days during which German target areas were obscured by 6/10 to 8/10 cloud. On twelve other days temporary clearances were predicted over certain target areas in the Reich. On two of these days missions were scheduled to German targets and completed; on the others the weather closed in after 0800 or 0900, leaving too short an interval of daylight for the bombers to execute a long-range mission. Some of these days were salvaged by sending the bombers to targets of importance in occupied territory, and in fact the Eighth managed to complete a total of ten missions during the month, which was as many as had been accomplished during any one of the summer months.<sup>65</sup> But it was German targets that had above all to be destroyed, and it was with a sense of impatience that observers both in the field and in Washington watched valuable time elapse with no more "Regensburgs" to show for it.

Weather, it will be recalled, had been recognized as the most serious

limitation on daylight bomber operations from their very beginning in the ETO.\* For many months, when the strength of the Eighth was small, operations were sometimes limited by lack of enough crews and aircraft to conduct major operations economically, especially over Germany. Even in July 1943 the force was still not large enough to take complete advantage of all the favorable weather forthcoming during the latter part of that month. And, of course, the Luftwaffe remained the most serious cause of attrition. But, as had been demonstrated during the Regensburg-Schweinfurt mission of 17 August 1943, the American bombers could if necessary bomb effectively even in the face of the most intensive opposition, whereas no amount of skill or fortitude could place bombs on a target that could not be seen.

All this had been clear to Generals Spaatz and Eaker in the fall of 1942; and they had inaugurated experiments in blind-bombing techniques by which they hoped to circumvent overcast conditions. At Casablanca in mid-January 1943, when General Eaker was called upon to present the case for daylight bombardment, he admitted the serious limitations imposed by weather and revealed that efforts were being made to increase the rate of daylight operations by the use of navigational devices of the Gee and Oboe types, both of which depended on beams transmitted from ground stations. Both had been evolved by the British and were in operation by that date.<sup>66</sup> By then also, General Eaker had eight B-24's equipped with Gee, several of which had already made individual flights to enemy objectives for the purpose of alerting air raid defenses which might otherwise have relaxed under the protecting blanket of cloud. These "intruder" or "moling" missions were not, however, successful. The equipment was too valuable to be risked on missions of such small intrinsic value except under ideally protective cloud conditions; and with singular perversity the weather in each instance cleared sufficiently to prevent the aircraft from bombing.<sup>†</sup> "Moling" was abandoned in March 1943.<sup>67</sup> By the middle of February three missions had been undertaken with Gee planes acting as Pathfinders in the lead. Here again, however, results were unsatisfactory.<sup>68</sup>

The fact was that Gee, though an extremely valuable navigational aid, was not primarily a blind-bombing device. Both British and American airmen were becoming convinced that accurate bombing was not possible with it. More promising was Oboe, which the British had al-

\* See above, pp. 232-33.

† See above, pp. 262-63.

ready developed for short-range precision bombing. Accordingly, while retaining Gee for navigational purposes and installing it as rapidly as possible in all its aircraft, the Eighth Air Force turned to Oboe. But that program too made little progress. Like Gee, Oboe was not a self-contained radar apparatus; that is, it depended on beams transmitted from ground stations, and so its range, like that of Gee, was limited to about 200 miles for aircraft traveling at a 20,000-foot altitude. Moreover, the British had strictly limited supplies of this equipment and they were afraid that the Oboe frequency might become compromised before it could be used in sufficient quantity to be decisive. They also feared lest a set mounted in the relatively slow bombers might fall into the hands of the enemy. They preferred to use it in their own fast Mosquito bombers at night. On 11 March 1943 the Eighth Air Force accordingly agreed not to use Oboe over enemy territory in the daytime.<sup>69</sup>

Frustrated by the inadequacy of Gee for bombing, the lack of Oboe equipment, and the serious range limitations inherent in both, the Eighth turned its attention in March to another item of British equipment known as H2S, a self-contained radar device transmitting a beam which scanned the ground below and provided a map-like picture of the terrain on its cathode ray tube indicator. VIII Bomber Command had requested a trial installation of H2S as early as the fall of 1942. Interest in the equipment increased as it was used with growing effect by the RAF. In March 1943, after discussions between General Eaker and Air Chief Marshal Portal, eight units were formally requested by the Eighth Air Force and promised by the British. In making his request, Eaker stressed the urgency of the project. "I feel," he wrote to Portal on 15 March, "very strongly that we should press our plan to have sufficient quantities of this equipment to enable us to effect bombing from above the overcast by late summer or early fall, when there can be expected to be a large number of days when high level bombing would be impossible if the target cannot be seen."<sup>70</sup>

Throughout the spring and summer of 1943 the radar program progressed very slowly. This was inevitable as long as the Eighth Air Force was dependent on British equipment, because British agencies were unable to produce enough H2S sets to meet their own RAF demands. Assistance had clearly to be sought from American sources. The Radiation Laboratory, located at Massachusetts Institute of Technology, had already done considerable microwave research and development; and

once the situation in the United Kingdom had been thoroughly canvassed by Dr. David T. Griggs, who as radar consultant for the Secretary of War was familiar with the American radar programs, it was agreed that the Radiation Laboratory would supply U.S. equipment of the H<sub>2</sub>S type (the American version came to be called H<sub>2</sub>X) by September 1943. Meanwhile, plans for fall radar-bombing operations developed somewhat feverishly in a number of directions. The need was great, the equipment very limited in any one line, and knowledge of radar as yet far from complete. Consequently the plans laid by the Eighth Air Force included not only the self-contained H<sub>2</sub>S and H<sub>2</sub>X types but also the ground types of both British and American design, although the former received priority consideration.<sup>71</sup>

By 20 September 1943 the Radiation Laboratory had built and installed twelve H<sub>2</sub>X sets in as many B-17 aircraft and twelve navigators had received some training in their operation. Late that month the twelve planes arrived at Alconbury, where the navigators underwent further training. Meanwhile, H<sub>2</sub>S installations were proceeding in the Eighth. Four operators who had been trained by the RAF, though still in the learning stage themselves, began teaching a few navigators gathered at Alconbury.<sup>72</sup> General Eaker was then able to plan in September to operate a Pathfinder group (the 482d) consisting of three squadrons, one equipped with British devices (primarily H<sub>2</sub>S) and supplied with personnel trained in the theater, the other two provided with American equipment (primarily H<sub>2</sub>X) and supplied and reinforced from the United States. For combat purposes, of course, these specially manned and equipped bombers would have to fly with individual formations in the position of combat wing leader.<sup>73</sup> Toward the end of September the H<sub>2</sub>S planes were ready for combat and actually flew their first bombing mission (disregarding the single H<sub>2</sub>S plane that participated in the operation of 17 August by dropping two tons of bombs on Frankfurt) on 27 September 1943. The H<sub>2</sub>X-equipped bombers executed their first combat mission on 2 November of that year.<sup>74</sup>

The unusually bad stretch of weather during September caused General Eaker to stage the first H<sub>2</sub>S mission a few days earlier than he had originally planned. Emden, although not a CBO target, was selected as the objective. Several factors influenced this choice.<sup>75</sup> Emden was an important port, having taken over much of the shipping from Hamburg and Rotterdam. It was small enough (less than one mile in

diameter) to test the accuracy of the equipment. And its location on the coast made it a suitable objective for not too well-experienced navigators, because H<sub>2</sub>S (H<sub>2</sub>X) discriminates more sharply between land and water than between various land surfaces. Moreover, it was near enough to allow the P-47's of VIII Fighter Command, if equipped with long-range tanks then available, to accompany the bombers to the target.<sup>76</sup>

Approximately 305 B-17's of the 1st and 2d Bombardment Divisions were dispatched on 27 September to bomb Emden with H<sub>2</sub>S-equipped planes as guides. The B-24's of the 2d Bombardment Division, having none of their number so equipped, executed a diversionary feint toward the Brussels area while the main force was approaching the target. Each of the two B-17 divisions, operating as separate task forces, had been assigned two Pathfinder planes, but by the time the target area was reached, equipment failure had left only one H<sub>2</sub>S set operating in each division. Each task force flew in three combat wings with the Pathfinder in the lead wing. The plan was for all bombers of that wing to bomb on signal from the Pathfinder, which would also drop marker bombs to guide the following wings. Should the cloud cover break, instructions were to bomb visually. As it turned out, the second wing of the first force succeeded in bombing on the marker, and the second wing of the second force, having found a temporary break in the 9/10 cloud, attempted to bomb visually. The third combat wing of each force was unable to locate the markers and had to attack targets of opportunity in the neighborhood. Both divisions enjoyed the very effective support of four groups of P-47's. With the aid of belly tanks (mostly of 75-gallon capacity) the Thunderbolts were able to accompany the bombers for the first time the entire way to a German target. Despite stiff enemy opposition the bombers lost only 7 of the 244 that succeeded in bombing either Emden or targets of opportunity. The P-47's lost 2 of their number and claimed to have destroyed 21 of the enemy.<sup>77</sup>

Next day out, 2 October, the Eighth sent an even heavier force (349 took off and 339 attacked) on a repeat mission to Emden. Except for steps taken to reduce confusion at the approach to the target, the second operation was carried out substantially on the same lines as the first. VIII Fighter Command support proved even more effective than on the earlier mission and the bombing force lost only two planes.<sup>78</sup>

Although by no means completely successful, these two initial attempts at radar bombing gave room for restrained optimism regarding



the new techniques. Three of the four combat wings that bombed on an H<sub>2</sub>S plane achieved the reasonably small average circular error of from one-half to one mile. Difficulty in the fourth sighting resulted in an abnormal error of two to three miles. Results were less encouraging for the combat wing that attempted to bomb on flares dropped by the Pathfinder planes. Confusion at the IP during the first mission and a high wind during the second, which blew the smoke of the markers rapidly from the target area, help to account for an average error of more than five miles. One of the leading combat wings did considerable damage. None of the other bomb falls damaged the assigned target. More encouraging than the bombing was the fact that the enemy fighters, since they had to intercept through the overcast, fought at a distinct disadvantage. Overcast bombing was obviously a safer type of bombing than visual.<sup>79</sup>

In retrospect, two things were clearly required. First, it was necessary to master more thoroughly the tactics and techniques of radar bombing, and second, more radar-equipped planes would have to be provided. The most promising bombing had been accomplished by combat wings directly led by a Pathfinder, and even then the resulting bomb pattern would have been much more concentrated if the job could have been done by combat boxes rather than by the larger formation. That would mean assigning at least one Pathfinder plane to each operating group. Despite the qualified success of these initial operations, the Eighth looked forward with justifiable enthusiasm to an accelerated campaign of radar bombing.<sup>80</sup>

Radar was a device capable of working for the enemy as well as against him. It enabled him to sight his antiaircraft guns with some degree of accuracy and it allowed him to give early warning of an approaching bomber force to his fighter defenses. As the cost of penetrating German fighter and flak defenses continued to mount, the Eighth Air Force gave increasing thought to methods of confounding the German early warning and gun-laying radar equipment. Since July 1943 the RAF had been using with apparent success a tactic which consisted of dropping sheets of metal-coated paper (about 14 by 21 inches) which produced "echoes" on enemy radar receivers comparable to those from aircraft. "Window," as it came to be known, was adapted by the AAF during the fall of 1943 for use in large bomber formations and was given the name of "Chaff." In its new form it consisted of foil strips about 1/16th of an inch in width and approximately 11 inches

long, 2,000 of which were found to be electrically the equivalent of a B-17 airplane. The Eighth had also been interested since the summer of that year in developing airborne transmitters which could be used to jam German ground radar. This equipment, under the name of "Carpet," was, in fact, the first of the radio countermeasures to be used operationally by the Eighth.<sup>81</sup>

On 8 October 1943 the Eighth used Carpet for the first time. The equipment had been installed in two groups of the 3d Bombardment Division, and when that outfit was dispatched to bomb the city of Bremen, 40 of the planes in the lead combat wing carried Carpet. As it happened, that day's effort was of record proportions. Of 399 heavy bombers dispatched, 357 bombed objectives at Bremen and Vegesack (submarine building and airframe construction). And, as usual on trips to that area, the attackers ran into heavy flak and fighter defense. In all, 30 bombers were lost and 26 received major damage; the intensity of the air battle was further indicated by claims of 167 enemy aircraft destroyed. It is now evident that these claims were greatly exaggerated, but enemy records showing a loss in combat that day of 33 fighters destroyed and 15 damaged bear strong testimony to the marksmanship of AAF gunners.\* Three-fourths of the planes of the 1st Bombardment Division suffered some degree of flak damage. The Carpet-protected 3d Division incurred only 60 per cent flak damage, but it was not considered safe to assume that the difference resulted from the use of radio countermeasures.<sup>82</sup> Certainly this mission of 8 October had been costly enough, even to the 3d Division, which lost 14 bombers of the 156 that bombed, suffered major damage to 9, and minor damage to 91 (principally from flak).

Carpet was used nevertheless on six of the principal missions executed during the rest of October 1943 and resulting experience pointed encouragingly to the protection given by the new equipment.<sup>83</sup> On the basis of this experience and with the help of research agencies in the AAF and the RAF, the Eighth developed an extensive radio and radar countermeasure program with an eye to compromising both the enemy's fighter-control system and his radar-controlled gun-laying equipment.<sup>84</sup>

The Germans were well aware of the threat to their radar equipment,

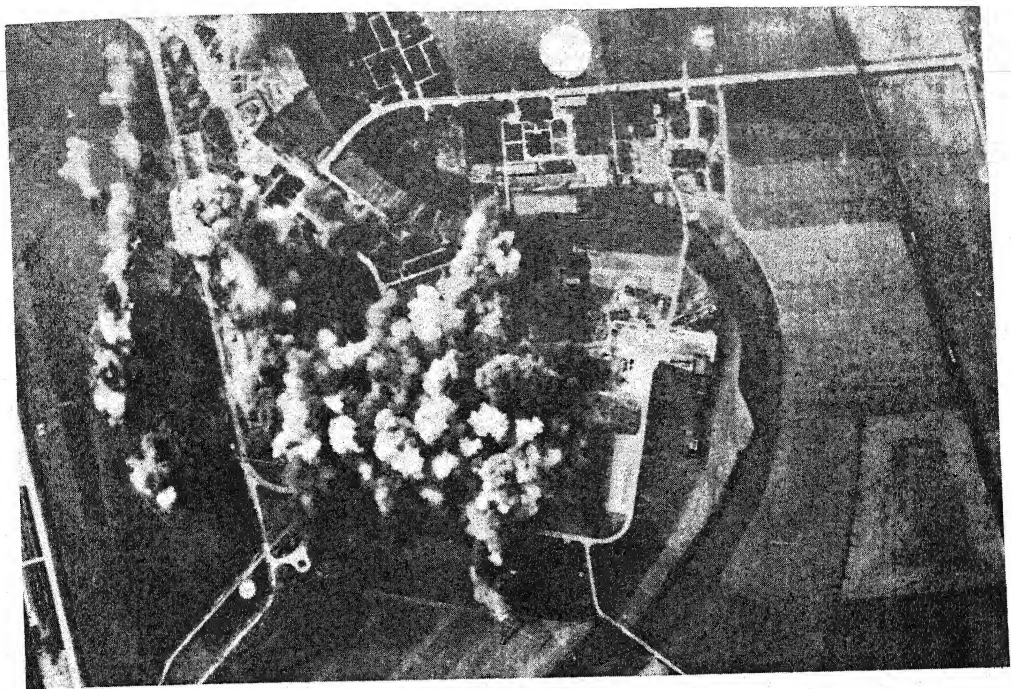
\* Information supplied through courtesy of British Air Ministry and based upon records of General Quartermaster's Department of the German Air Ministry. These records show additional losses for the day not directly attributed to "enemy action" of 4 fighters destroyed and 7 damaged.

the relatively low frequency of which made it quite susceptible to jamming. The use of radar countermeasures by the Allies thus came as no surprise to the German technical experts who had as early as 1942 recommended the development of antijamming measures. But it was not until after the Hamburg raid of 25 July 1943, during which the RAF had managed to neutralize the ground radar almost completely by the use of Window, that official attention was turned somewhat frantically to the development of antijamming equipment. Shortly after that mission antijamming modifications were put into operation. Although these projects showed some improvement after autumn 1944, none of the antijamming devices proved entirely successful; German sources claim that under heavy Window or Carpet seldom more than 10 to 40 per cent of their radars were effective, and then only long enough to take an altitude "fix" for use in barrage fire.<sup>85</sup>

### *The Critical Week*

The second week of October 1943 marked a turning point in the daylight bombing campaign. Following hard upon the Bremen-Vegesack mission of 8 October, just described, came four major efforts on the part of the Eighth Air Force to destroy targets well within Hitler's stronghold. In each case the losses incurred were heavy—in the last, the mission of 14 October to Schweinfurt, disastrous. Despite some efficiently executed and relatively effective bombing accomplished in the teeth of this concentrated opposition, the week's operations ended in discouragement and a decision to alter for the time being the conduct of the Combined Bomber Offensive insofar as it involved the American heavy bombers.

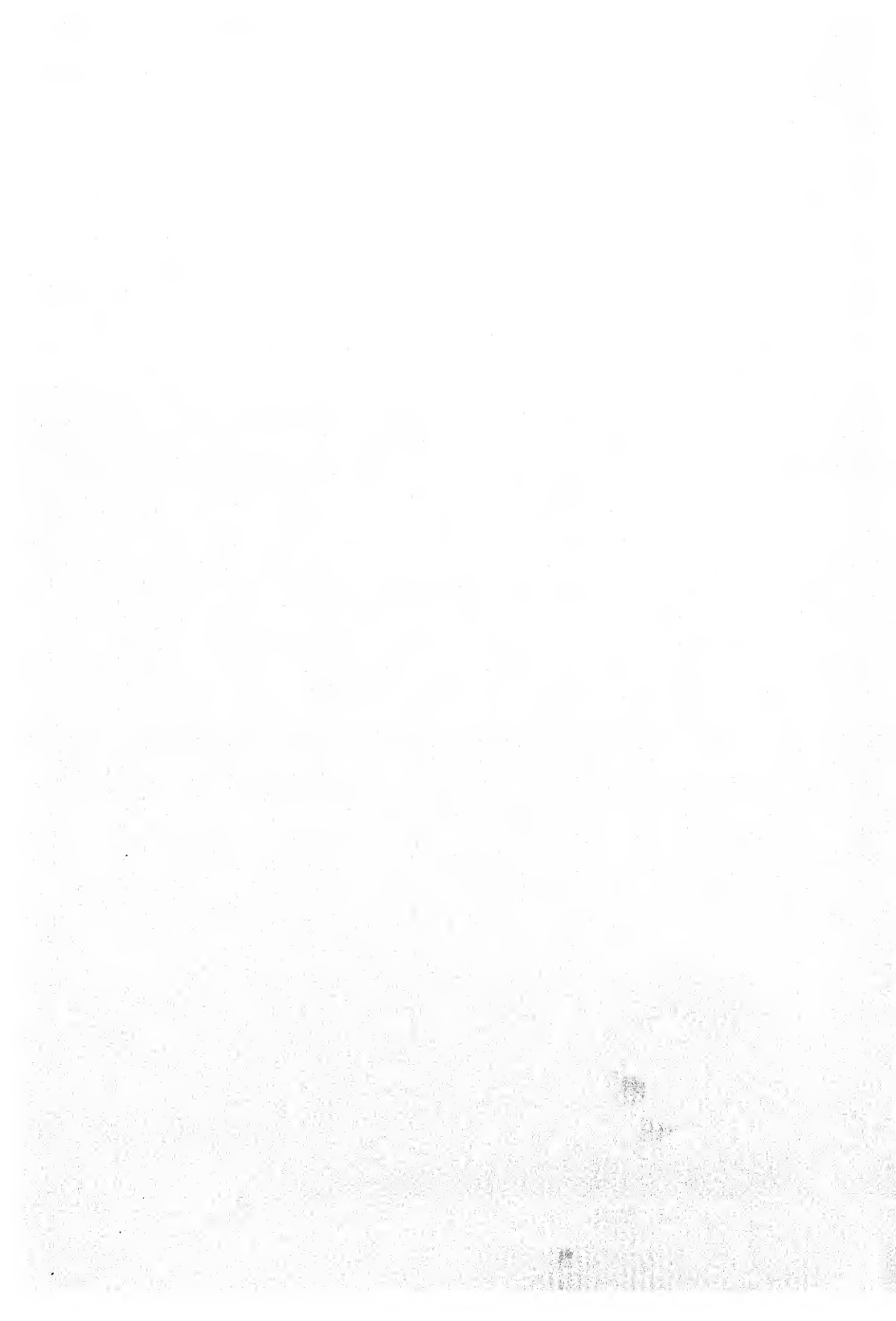
On 9 October, the day following the big air battle over Bremen, the Eighth sent out almost as large a force as on that record day. In spite of the loss of 30 bombers incurred the day before and damage to over half the remainder, it dispatched on the 9th a force of 378, of which 352 are credited with bombing their objectives, which, by the way, were the most distant yet attempted by the Eighth. Flying a route that led over the North Sea and across Denmark, three forces, totaling 150 planes, reached the Polish corridor and bombed port facilities and German naval units at Gdynia and submarine slips at Danzig. Another force, numbering about 96 planes and following a similar route, pushed on into East Prussia to attack the Focke-Wulf assembly plant at Marienburg, over 200 miles east of Berlin. Meanwhile 106 bombers attacked



MARIENBURG MISSION, 9 OCTOBER 1943

*Above:* STRIKE PHOTO

*Below:* RECON PHOTO



the Arado aircraft factory at Anklam, a target 200 miles nearer than Danzig to England. This latter effort was intended primarily as a diversion to contain the German Air Force in that area so that the forces flying to the more distant objectives might meet with a minimum of interference. As such it succeeded, but at the cost of 18 out of the 106 planes. The main force lost only 10 bombers.<sup>86</sup>

The bombing that day ranged from poor to spectacular, but with the exception of the failure of the 2d Bombardment Division at Danzig and Gdynia, bombing at all targets was of a high order. At Anklam the Arado factory, engaged in manufacturing components for the FW-190's, suffered damage to virtually all its buildings. Damage to naval units and port facilities at Gdynia was also severe. But it was at Marienburg that the most brilliant bombing was done. There the Focke-Wulf plant was almost completely destroyed by high-explosive and incendiary bombs dropped with unprecedented accuracy. Although at both Marienburg and Anklam the bombing was done at relatively low altitudes (11,000 to 14,500 feet), a tactic permitted by the surprise nature of this unexpectedly long flight, accuracy—especially at the former—was remarkable and was hailed by General Eaker as “the classic example of precision bombing.”<sup>87</sup> Of the 598 x 500-pound GP bombs dropped over Marienburg, 286 were identified by aerial reconnaissance as having fallen within the factory area. Of these, at least 35 were direct hits on buildings. In addition to the destruction by high explosives, incendiary bombs caused major damage by fire; but their poor ballistic qualities prevented as fine a concentration of them as with the high explosives.<sup>88</sup>

This day's work served to raise still higher the general level of bombing accuracy, which had shown distinct improvement since summer. In July 1943 the Eighth as a whole placed only 12.7 per cent of its bombs within 1,000 feet of the aiming point and 36.7 per cent within 2,000 feet. In October these figures had been raised to 27.2 per cent and 53.8 per cent, respectively.<sup>89</sup> The change may be explained in part by the fact that the new bomber groups, which arrived in May and June, had become gradually more experienced. Then, too, bombardier training had received special emphasis both in the theater and in the United States during the summer and early fall and had been recognized as the heart of the entire training program.<sup>90</sup>

Another reason may be found in revised tactics. During the first half of 1943 formations designated to follow the first two over the target



had experienced much difficulty and confusion, with the result that their accuracy fell off very rapidly. From 1 January to 26 July the first two formations over the targets had placed, respectively, 26.4 and 15.7 per cent of their bomb tonnage within 1,000 feet of the aiming point, whereas those in the third and fourth positions succeeded in dropping only 9.7 and 7.8 per cent within that charmed circle. The problem was recognized in May 1943 and by 1 September, although improvement in the first formations had amounted to only 5 and 32 per cent, respectively, the third and fourth formations had improved 58 and 105 per cent. Formations in positions still farther back showed improvement amounting to as much as 178 per cent. This improvement, which more than anything else raised the average of accuracy, resulted from separating the bombing formations with great care, especially as they approached the target.<sup>91</sup>

The bombing of Polish and East Prussian targets undoubtedly came as a surprise to the Germans. As it was intended to do, it demonstrated that few parts of the Reich could henceforth be considered immune from daylight attack. But the Luftwaffe still had it in its power to set a high, possibly even a prohibitive, tariff on such undertakings. True, total losses on 9 October had barely reached 8 per cent of the attacking force, but that spoke more for the element of surprise than for the ability of the bombers, unescorted, to defend themselves. It was the diversionary force that drew the bulk of enemy attention and its losses amounted almost to 17 per cent. Again, on the day following, the Luftwaffe exacted a high toll of the force dispatched to bomb the important Ruhr traffic junction of Münster. On this occasion the German fighters used a technique which was to become famous. From the initial point to the target and on the return trip until fighter escort came to the bombers' aid, a heavy force of FW-190's, Me-109's, Ju-88's, Me-210's, and Me-110's attacked the leading formation, concentrating on one group at a time. The Germans flew parallel to the bombers, out of range, in groups of twenty to forty, stacked in echelon down. They then peeled off, singly or in pairs, in quick succession to attack the lowest elements of the formation. Their first victim was the 100th Bombardment Group which flew in the lead position. Two minutes after the concentrated attack on this unit began, its formation was broken up, and in seven minutes the entire group had been destroyed or dispersed. All twelve of the 100th Group planes that saw action in the Münster battle were lost. Other groups of the leading task force (composed of

units of the 3d Bombardment Division) suffered heavily, though not, of course, so heavily as the ill-starred 100th. In all, 29 of the 119 bombers of this 3d Division were lost. Claims registered against the enemy by crews of that division alone included 177 destroyed.\* The second task force, comprising 117 bombers of the 1st Bombardment Division, profited by the German policy of concentration, losing only one of its planes and encountering only feeble opposition.<sup>92</sup>

These October air battles over Germany also gave evidence of the increasingly effective use being made by the Luftwaffe of rocket projectiles. Rockets had caused serious damage in the Bremen battle and again over Anklam. Generally they were carried by FW-190's and Me-109's which, after lobbing them into the bomber formation at 1,000- to 1,700-yard range, resumed operations as standard fighters.<sup>93</sup> During the Münster mission, Ju-88's and even bombers of the Do-217 and Do-215 types flew parallel to the bombers—firing rockets at 1,000- to 1,500-yard range. In addition, twin-engine fighters shot explosive cannon shells into the bomber formations at 200- to 1,500-yard range.<sup>94</sup> But it was not until the second mission to the ball-bearing plants at Schweinfurt on 14 October that the Luftwaffe unleashed a really large-scale rocket attack completely coordinated with other fighter tactics. The resulting air battle developed epic proportions.

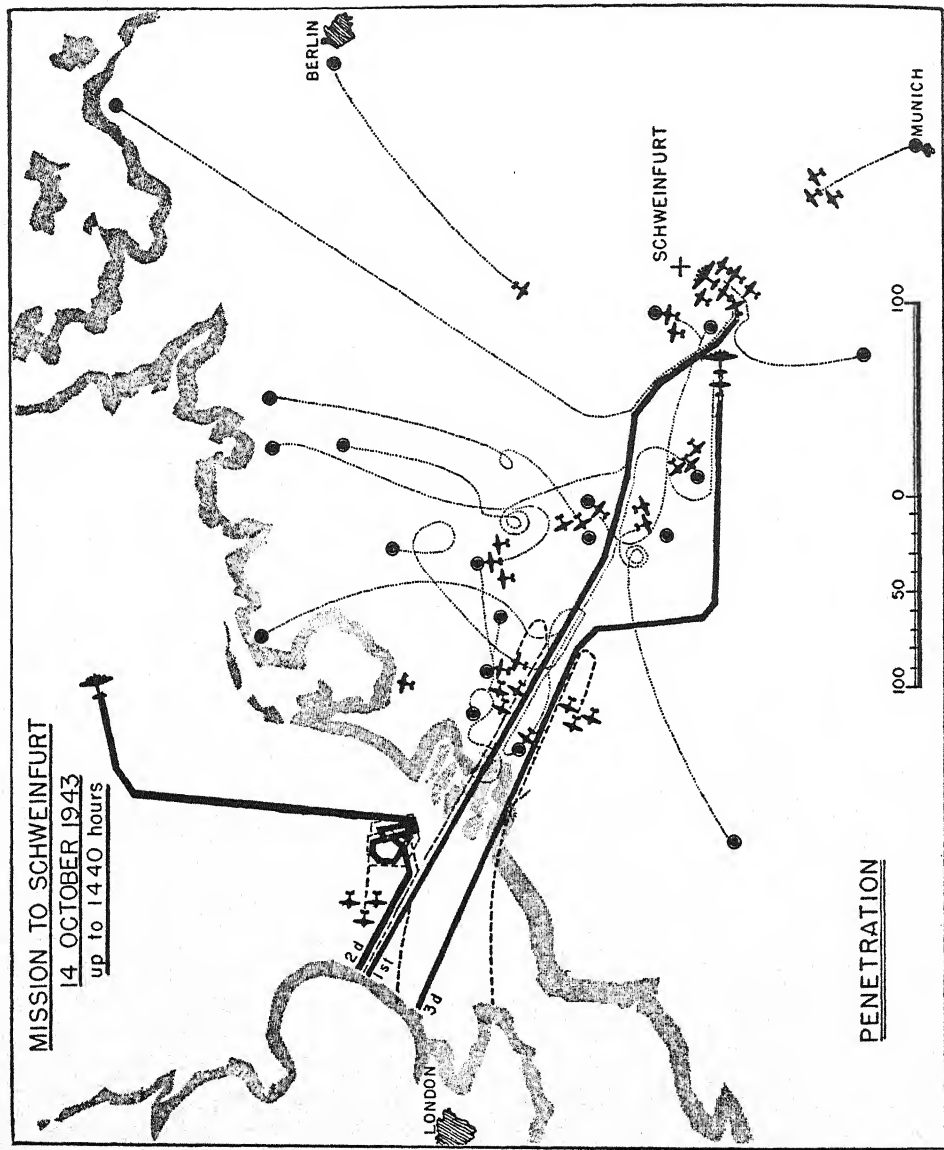
A total of 291 B-17's were dispatched in two forces, 149 from the 1st Bombardment Division and 142 from the 3d Bombardment Division, to cross enemy defenses abreast, some 30 miles apart. Plans called for a third force, composed of B-24's from the 2d Bombardment Division, to fly a longer route to the south. Since the route of the B-17's was planned beyond the maximum normal endurance of that aircraft, those planes not equipped with auxiliary tanks were ordered to carry one bomb-bay tank. Each force was assigned one group of P-47's to escort the bombers to the maximum fighter range and one additional group of P-47's for withdrawal support from 60 miles inland to mid-Channel. It was intended that one group of P-38's, recently arrived in the United Kingdom, would give the bombing force the benefit of its range in order to sweep the area ahead of the penetration, but they did not be-

\* On 9 October the GAF lost in combat 14 fighters and suffered damage to 9 fighters, including night fighters. Losses attributed to causes not directly charged to enemy action were 3 fighters destroyed and 10 damaged. The following day showed losses of 22 destroyed and 5 damaged, with 5 destroyed for causes not attributed to combat and 2 damaged. Total claims by AAF crewmen on 9 October were 122 destroyed. For the mission of 10 October their claims were 183 destroyed by bombers, 21 by escort fighters.

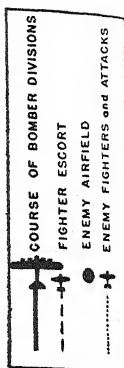
MISSION TO SCHWEINFURT

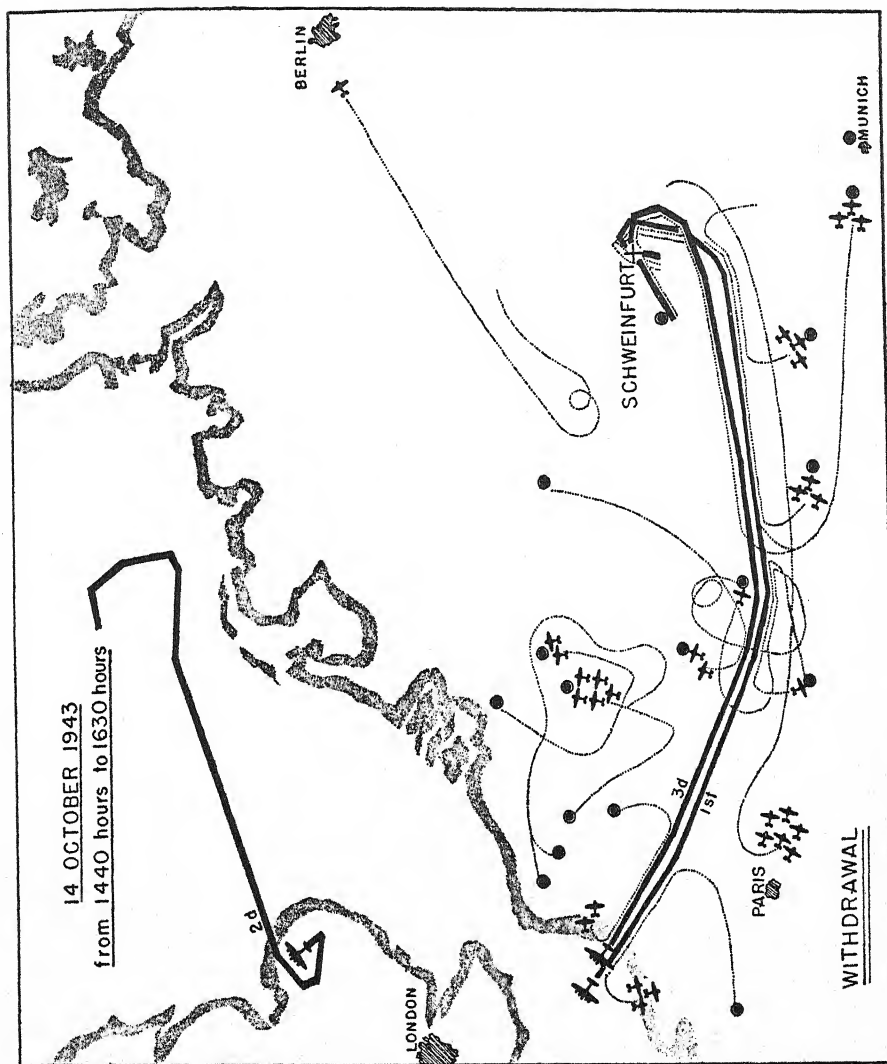
14 OCTOBER 1943

up to 1440 hours



PENETRATION





come operational until the following day. In order to protect stragglers, two squadrons of RAF Spitfire IX's were designated to sweep the area of withdrawal five minutes after the last force had emerged from the enemy belt-line defense.<sup>95</sup>

Weather conditions over England handicapped the operation to some extent and forced some alteration in plans. Both B-17 forces managed to assemble with some aid from Gee equipment. The B-24's, however, found it impossible to assemble properly. Two units, numbering 29 planes, finally joined forces but, having decided that such a small force did not have strength enough to make a deep penetration of enemy territory, they flew an uneventful diversionary feint in the direction of Emden. Weather also prevented the bombers from picking up the withdrawal escort.<sup>96</sup>

As soon as the P-47 escort turned back near Aachen (some 240 miles from the British coast) the Luftwaffe made its appearance in force and continued to harass the bomber formations to the target and back again to the Channel coast. Most of the tactics used by the German fighters that day had been used before—formation attacks, the use of rockets and large-bore cannon, air-to-air bombing, concentration on one group at a time and on stragglers—but never before had the enemy made such full and such expertly coordinated use of these tactics. Indeed so well planned was the counterattack that it gave rise to the suspicion that the German fighter control had received advance warning of the timing and objectives of the mission. Available evidence is not sufficient to establish the suspicion as a fact nor to eliminate it.<sup>97</sup> The enemy could well have guessed the general nature of the mission. It had been attempted before, a return attack might be expected, and weather over the target area could be predicted as favorable to bombing. At any rate, the GAF turned in a performance unprecedented in its magnitude, in the cleverness with which it was planned, and in the severity with which it was executed.<sup>98</sup>

Wave after wave of fighters attacked. Usually a screen of single-engine fighters would fly in from in front, firing normal 20-mm. cannon and machine guns until very close to the formation. Closely following the single-engine fighters, large formations of twin-engine fighters appeared in waves, each firing large numbers of rockets from projectors carried under the wings. They lobbed their rockets into the bomber formations, generally from about 1,000-yard range and from the rear, making use of the natural advantage in sighting afforded by

stern attacks. Like good duck hunters they fired at the leading element, knowing that the normal spread of bursts would be likely to give them hits. Meanwhile, the single-engine fighters refueled and attacked from all directions. Soon they were followed by re-formed groups of twin-engine rocket carriers. After expending their rockets, these twin-engine fighters frequently came in firing cannon and machine guns. The enemy aircraft concentrated on one formation at a time, breaking it up with rocket attacks (which by the way were, like flak, more effective for this purpose than for immediate destruction) and then finishing off cripples with gunfire. One combat wing of the 1st Bombardment Division, which bore the brunt of the counterattack, was almost completely wiped out by these tactics.<sup>99</sup>

It was a sadly mauled force that finally reached the target. The 40th Combat Wing which led the 1st Division had already lost seven of its forty-nine planes, and several more were so seriously damaged that they were soon to become part of the total of twenty-nine lost by that formation. The two forces together lost twenty-eight planes before the target. Yet the bombing was unusually effective. A sudden change of course executed near the IP had apparently confused the enemy fighters and the air attacks fell off considerably as the bombers turned into their bomb run. Visibility was good, at least for the first force (1st Division)—the second-force bombardiers were handicapped by clouds of smoke caused by the preceding attack. The result was a high concentration of bombs in all the target areas. Even the crippled 40th Combat Wing was able to place 53 per cent of its bombs within 1,000 feet of the aiming point. In all, the 228 B-17's that succeeded in bombing dropped some 395 tons of high explosives and 88 tons of incendiaries on and about all three of the big bearing plants. Of the 1,122 high-explosive bombs dropped, 143 fell within the factory area, 88 of which were direct hits on the factory buildings. The incendiaries, as usual, proved somewhat less accurate.<sup>100</sup>

Strategically it was the most important of the sixteen raids made during the war on the Schweinfurt plants. It caused the most damage and the greatest interference with production, and it led directly to a reorganization of the bearing industry. The raids of 14 October, coming upon the still fresh damage of 17 August, alarmed the German industrial planners to a degree that almost justified the optimistic estimates made by Allied observers in the fall of that year.<sup>101</sup> Although the machine damage wrought on 14 October amounted to only 10 per cent



and therefore hardly warranted the estimate made shortly thereafter by Allied interpreters that over 50 per cent of Germany's capacity for producing bearings had been destroyed, the damage was felt in critical departments of the industry, and the testimony of Speer and others acquainted with the situation leaves no doubt that the enemy took a grave view of the matter. The industry in the fall of 1943 was concentrated in a few places, all of which were known to Allied intelligence agencies, and the machinery was as yet largely unprotected. In the opinion of the United States Strategic Bombing Survey, had these two 1943 attacks been followed up, the German bearing situation might have become critical indeed. As it was, even the second attack caused only a temporary setback in production, and no further attempt was made to bomb the Schweinfurt plants for another four months. Meanwhile the Germans were able to reorganize the industry so thoroughly that any further effort to destroy it was doomed to failure.<sup>102</sup>

There were, however, certain good reasons why the Eighth Air Force failed to return to Schweinfurt for over four months. The mission of 14 October had demonstrated that the cost of such deep penetrations by daylight without fighter escort was too high to be consistently borne. To be specific, it had cost the Eighth 60 B-17's and crews, to say nothing of the major damage suffered by 17 aircraft and the reparable damage sustained by 121. Claims of 186 enemy fighters destroyed, even if not discounted, would hardly balance these losses.\* It is also true that those in charge of Eighth Air Force operations tended to overestimate the degree of lasting damage inflicted on the Schweinfurt plants. It was generally felt, both in Eighth Air Force headquarters and in Washington, that a decisive job had been done. Brig. Gen. Curtis E. LeMay, commanding the 3d Bombardment Division, declared after the 14 October mission: "All crews have again been impressed with the importance of making every possible effort to complete the destruction of each target on the first attempt making it unnecessary to return later."<sup>103</sup> General Arnold told press correspondents with some finality, "Now we have got Schweinfurt."<sup>104</sup>

Opinion in favor of return attacks at an early date was, it is true, expressed by industrial analysts. The British Ministry of Home Security, in a review of the Schweinfurt situation dated 18 November 1943,

\* That they must be discounted is indicated by enemy records showing total combat losses for the day, exclusive of those obviously not attributable to AAF action, of 38 fighters destroyed in combat and 20 damaged. Five fighters destroyed and 11 damaged for reasons not attributed to "enemy action" could possibly be added to these totals. (Information supplied through courtesy of British Air Ministry.)

stated unequivocally that the bearing plants "are ready for practically immediate re-attack."<sup>105</sup> The Combined Operational Planning Committee does not, however, appear to have given Schweinfurt a high place in plans for December operations. Its original plans for the ARGUMENT operation (dated 2 November 1943)—the plan that was shaped with the idea of striking a coordinated and decisive blow at the industries underlying the German Air Force and which was to mature during late February 1944 in the so-called "Big Week"—did not include the Schweinfurt bearing plants, although they eventually became objectives for that magnificent operation.<sup>106</sup>

For the time being, moreover, the Eighth Air Force was in no position to make further penetrations either to Schweinfurt or to any other objectives deep in German territory. The Schweinfurt mission, bad enough in itself, had climaxed a week of costly air battles. Within the space of six days the Eighth lost 148 bombers and crews, mostly as a result of air action, in the course of four attempts to break through German fighter defenses unescorted.<sup>107</sup>

The fact was that the Eighth Air Force had for the time being lost air superiority over Germany. And it was obvious that superiority could not be regained until sufficient long-range escort became available. Fighter escort was clearly the answer to the German counter-attack, especially to the rocket-firing fighters which, lacking somewhat in mobility, were peculiarly vulnerable to attacks by other fighters. But clearly, also, fighter range would have to be extended beyond the capabilities then foreseen for the P-47.<sup>108</sup> A few P-38's (the 55th Fighter Group) were already in the theater and became operational on 15 October 1943. With two 75-gallon wing tanks these planes could achieve a maximum escort radius of 520 miles, and with two 108-gallon tanks they could by February 1944 go up to 585 miles. This was a considerable improvement over the P-47's which, even when they began to use a few of the new 108-gallon belly tanks in August and September 1943, could count on a theoretical radius of only 375 miles at the very most and which, before February 1944, could not escort the bombers in force much beyond 300 miles. Another group of P-38's (the 20th Fighter Group) began operations in December 1943. The P-51's, which were eventually to solve the problem of long-range escort, did not become available for combat until December, and it was not until March 1944 that they were equipped with the extra fuel tanks that could take them as far as the bombers themselves were likely to go.<sup>109</sup>

The Eighth Air Force made no more deep penetrations in clear

weather into Germany for the rest of the year. That failure was, prior to December, the result of a command decision based on the lack of escort and the need for recuperating the bomber force after its losses on 14 October. After the early part of December the decision was forced by weather, although the Eighth still lacked long-range escort sufficient to make deep penetrations anything but costly affairs, justifiable only on grounds of decisive results.<sup>110</sup> Weather had been bad for visual bombing during the last two weeks of October and it did not improve greatly during November, although the Eighth found it possible to run a number of missions to targets in occupied territory and to conduct a few blind-bombing operations over Germany. ARGUMENT, involving an attack on such distant centers as Leipzig, Oschersleben, Gotha, Halberstadt, Bernberg, Schkopau, and Stuttgart, was being planned during November as a coordinated attack by the Eighth and the newly established Fifteenth Air Force in Italy. And the operation was initially scheduled for a date early in December.<sup>111</sup> It so happened that a long enough stretch of fine weather and one prevailing over a wide enough area to permit accurate bombing by such a coordinated force did not occur until late in February 1944.

By mid-October 1943 the daylight bombing campaign had reached a crisis. Its cost had risen alarmingly while its successes remained problematical. The assumptions underlying it therefore came up for re-examination. The CBO had by October come to the end of its second planned phase, and it became a matter of the utmost concern to all those in charge of the operation to determine whether or not it had accomplished its objectives. It was of particular importance to examine the work done by the American daylight force, for around it there still tended to gather certain doubts and questions. Were the rate and weight of Eighth Air Force operations sufficient to permit it to accomplish the job set for the daylight bombers, namely, the achievement of air superiority over the GAF in time for OVERLORD? After months of action against aircraft factories and airfields, had the Eighth Air Force caused any actual decline in the strength of the Luftwaffe? Should the effort of the Eighth Air Force be supplemented by another strategic bombing force based in Italy? During the fall of 1943 air forces required for the support of OVERLORD were being organized and the resulting administrative problems became closely linked with those of strategic policy. The operational crisis of October within the Eighth Air Force thus coincided with a crisis in planning for the entire air war in Europe.

*THE AUTUMN CRISIS*

IN PLANNING, as in operations, the crisis that overtook the Combined Bomber Offensive in the fall of 1943 centered upon the German Air Force. Recognized in the CBO Plan as the objective of the greatest immediate importance, the Luftwaffe and the industry supporting it had continued to occupy the attention of strategic air planners, and to a steadily increasing extent as the year wore on. The bomber offensive was considered to be a prerequisite to OVERLORD. Before that operation could safely be attempted the Allied strategic air forces would have to gain air superiority over western Europe. That meant substantially defeating the fighter force upon which the enemy depended for the protection of the homeland and upon which he had lavished—belatedly—the best of his intellectual and material resources. Now in the fall of the year, with OVERLORD scheduled for the following May, it was a matter of the utmost concern to Allied planners to determine the exact status of the strategic air war.

The task was not an easy one. Intelligence data was necessarily limited and estimates of the progress of the CBO could at best be only carefully reasoned guesses. It was clear that the Germans were on the strategic defensive in the west and that they were making every effort to build up their air defenses. As for the Allied effort, it seemed obvious that in its hard blows against the airframe, bearing, and rubber industries the Eighth Air Force had seriously damaged important parts of the industrial machine which fed the Luftwaffe, that the RAF in its bombing of industrial centers had contributed in an incalculable degree to the destruction, and that the air battles fought in the course of strategic missions had imposed an appalling wastage upon the German fighter force at an equally appalling cost to the AAF force in bombers and crews. Unfortunately, the bomb tonnage and the cost were all that could be definitely stated at the time. (In the case of the Eighth Air

Force, 1,965 tons had been dropped on the German aircraft industry since early April 1943 in the course of 14 attacks, and the loss rate had by October risen to 9.2 per cent of credit sorties.<sup>1</sup>) The precise effect of all this effort on the production of fighter aircraft and on the front-line strength of the Luftwaffe was another and more difficult question.

What made the problem especially baffling was the apparent paradox of increased production of enemy fighter planes in the face of increasingly devastating bombardment and the increasingly vicious air fighting. British intelligence agencies (from which the American bomber force derived most of its information concerning the enemy) knew that the front-line German fighter strength was growing steadily throughout the summer and early fall of 1943. According to their estimates, which later proved to be remarkably accurate, 591 single-engine enemy fighters were in front-line units on the western front by mid-year, 1943. By October the enemy strength in that category and that area had risen to well over 700, though estimates of 789 were probably high. Much of that increase came from redeployment of single-engine fighters from the eastern and Mediterranean fronts. Whereas by July of 1943 the Germans had only 30 per cent of their day fighters (both single- and twin-engine) on the western front, by October that figure had risen to 56 per cent. Here also contemporary estimates of 65 per cent of total fighter strength on the western front by September tended to be high. The Russian fighting continued to absorb a higher proportion of German air strength than was generally understood to be the case by western observers during the war.<sup>2</sup>

This error stemmed in part from the much larger error made in estimates of enemy aircraft production. Allied intelligence having tended during 1941-42 to overestimate German aircraft production, in 1943 was inclined increasingly to underrate the recuperative powers of that industry, especially in the critical category of single-engine fighters. Against an estimated average monthly production of 595 single-engine fighters for the first six months of 1943 and of 645 for the last six months, actual production, as determined from German Air Ministry records, reached 753 and 851 per month respectively for those periods.<sup>3</sup> It was natural for those who were making the evaluations to overstate the degree of destruction caused by Allied bombing and to underestimate the ability of the Germans to recuperate from the attacks.<sup>4</sup> But throughout 1943 the necessity for repeated precision attacks

on major targets—with intervals of only a very few weeks—was not generally appreciated.\*

As a matter of fact the Combined Bomber Offensive had by November 1943 seriously embarrassed the German aircraft industry. The daylight bombers of the Eighth Air Force had made thirteen attacks on factories engaged in manufacturing FW-190 and Me-109 fighters and one attack on an engine plant. In addition, the two heavy attacks on the ball-bearing plants at Schweinfurt and the very successful bombing of the synthetic rubber factory at Hüls may be considered as part of this counter-air campaign. The very heavy bombing done by the RAF contributed substantially to the same end, though more indirectly, through the general demoralization of important industrial areas. Because the aircraft industry had not as yet been decentralized to the extent that it would be, the Allied bombs did a high degree of damage during these earlier attacks. Indeed, it was the lesson learned by the Germans during the summer and fall of 1943 that led to the adoption of a systematic policy of dispersal. Although the official general order to disperse the aircraft industry was not issued by the German high command until February 1944 (a decision which was undoubtedly delayed too long), the Air Ministry had recommended it as early as 1942, and during the latter part of 1943 large-scale dispersal movements were already under way on a voluntary basis. It was by forcing the Germans to disperse their vital industries that the bombing of 1943 made its principal contribution, albeit one of qualified value in the long run for, though it probably caused more immediate delay in production than did the bombs themselves, it placed the high-priority industries eventually in a better position to withstand strategic bombing attacks. As a result of both bomb damage and dispersal, production of single-engine fighters actually declined slightly in the fall and winter of 1943, and the planned program for fighter production was delayed as a result of the 1943 attacks by approximately three months. "The timing of this delay contributed significantly to the victory in the critical air battles of the winter of 1944," according to the report of the USSBS.<sup>5</sup>

But the delay, substantial enough if taken by itself in relation to production plans which were by this time enormous, constituted only a temporary interruption of the enemy program. Alarmed in the late months of 1942 by the growing threat of strategic bombardment, the Germans had awakened to the need for a greatly expanded fighter

\* See the discussion in the preceding chapter.



force. In December 1942 and again in October 1943 the program of fighter plane production was greatly enlarged, and these expanded plans commenced to bear fruit just about the time the Allied strategic bombers were beginning to bring to bear on the industry a degree of pressure which might ordinarily have been expected to reduce its production drastically. So it was that, except for the slump in the fall of 1943, the curve of fighter production tended steadily to rise despite all efforts to destroy the capacity of the industry.<sup>6</sup>

If, however, fighter aircraft continued to flow from the factory to the front-line unit in steadily increasing quantity, it is also true that they were lost in steadily increasing numbers in the desperate defensive battles they fought against the strategic bombing forces. The great air battles of the summer and early fall of 1943—Regensburg, Schweinfurt, Stuttgart, Münster, Kiel, Hannover, and Kassel, to name but a few—had forced the German fighters to close with constantly growing forces of bombers and to run the gauntlet of escort fighters, the expanding fuel capacity of which was carrying them ever deeper into the Reich.

Here again Allied intelligence fell into a certain understandable confusion. In October a report by the intelligence section of Eighth Air Force, covering the first twelve months of American operations from the United Kingdom, indicated a sharp discrepancy between British estimates of GAF strength, wastage, and production (which were the only such estimates available) and American claims of enemy planes destroyed on daylight bombardment missions. The Americans claimed to have destroyed more single-engine fighters during this period than the British believed were lost by the enemy on the western front from all causes. The trouble could have arisen from errors either in estimated production, estimated wastage, or estimated strength. The first was naturally difficult to check accurately. The second was a category in which the British gained considerable experience during the Battle of Britain, and in which the American force had admittedly been far from accurate in the past despite every effort to be conservative. It was still virtually impossible to sort out the claims registered by a number of gunners all of whom might in a brisk air battle have been firing at the same enemy fighter. On the third matter, that of front-line strength, it was possible to provide a rough but convincing check through the reports of American bomber crews, which generally confirmed British estimates. "We know," the report declared, "that Fighter strength on the Western Front is increasing." It concluded that, while British

figures on production and wastage might be conservative, American claims of enemy fighters destroyed were undoubtedly too high.<sup>7</sup>

Even with evidence of an increase in German fighter strength on the western front, it was still possible that this increase reflected a policy of desperation implemented at the expense of reserves and operations on other fronts. On 14 October, General Arnold cabled General Eaker that, according to the evidence as it appeared in Washington, the GAF was on the verge of collapse and that the situation should be carefully investigated. Eaker, whose bombers on that very day had been frightfully mauled by the German fighters on their way to and from Schweinfurt, was nevertheless able to reply with restrained confidence (thinking no doubt of the 186 enemy aircraft claimed destroyed): "There is not the slightest question but that we now have our teeth in the Hun Air Force's neck." The battle of the 14th, serious as it was, he likened to "the last final struggle of a monster in his death throes." On more mature deliberation he cabled Arnold to the effect that, although the GAF appeared to be operating under severe strain which might ultimately lead to a breakdown, no evidence pointed to an early collapse.<sup>8</sup>

Opinion in the Eighth Air Force tended during the remaining weeks of the year to concentrate more and more on the sobering fact that the German fighter force in the west was increasing rather than decreasing in absolute strength. It was known that the enemy was on the defensive and had since October put into effect a strict policy of conservation in order to reduce the rate of attrition suffered during the summer and early fall. But by January 1944 it was becoming increasingly apparent that the German fighter force was being fed by rapidly accelerating production. There was concern also about the improvement in performance among German fighters—and with some reason, for although the level of pilot training had gone down considerably since late 1942 as a result of a decision to save aviation gasoline by reducing the number of flying hours for trainees, fighter units had improved their tactics and in the case of the FW-190 firepower had been greatly increased. One observer felt that this improvement in performance would be enough by the spring of 1944 to overcome the advantage even of the improved American fighter planes. A report dated 5 January concluded that the entire American daylight bombing program against strategic objectives located deep in Germany would be seriously threatened unless effective steps were soon taken to reduce the

enemy's fighter force both in quantity and quality.<sup>9</sup> This anxiety was soon reflected in Washington where, except for an incredibly naïve report issued by the office of AC/AS, Intelligence on 18 October stating that "aerial supremacy on a continental scale has been won," opinion came to be colored less and less by the tendency toward wishful thinking that had occasionally marked it prior to 15 October.<sup>10</sup>

### *Reappraisals*

A deepening concern over the stubborn refusal of the GAF to quit set the tone for estimates of the entire Combined Bomber Offensive, for the counter-air campaign had been given top priority and it was natural enough to evaluate the whole program with reference to its most important part. Concern for the counter-air campaign tended to center mainly on the Eighth Air Force, to which had been assigned the task of destroying the specific objectives of vital importance to the German aircraft industry. To the accomplishment of that campaign the work of the RAF was supposed to contribute and did contribute to a very considerable extent, but only indirectly through the bombing of the industrial areas of key importance to all German industry. Prevented from flying far into the Reich during the summer months on account of the short nights, RAF Bomber Command had directed its powerful forces against the industrial concentration in the Ruhr-Rhineland area. These and other planned operations promised long-term effects of great significance, but the immediate responsibility for crippling the GAF fell chiefly on the American daylight bombers.

Over-all estimates of the CBO in the latter half of 1943 contained a curious mixture of optimism regarding the results expected from the RAF's night area bombing and growing anxiety regarding the effects of the Eighth's daylight bombing campaign. The estimates placed before the Combined Chiefs of Staff at the Quebec conference in August, for example, have a good deal to say about the bombing of industrial areas. The results, admittedly difficult to measure, were believed to be far reaching not only through the undermining of civilian morale but through a general disorganization of the social and economic system upon which the enemy war machine depended. Although it was true that, in industry itself, only the "cushion"—the reserves and alternate facilities—had been destroyed, and in many cases not even that, reduction of excess capacity was important. Even more important was the indirect effect of bombing. Repair of a particular factory might, it was

argued, be possible in a short time if skilled labor, materials, and transportation were available. Labor might be obtained if there were housing to accommodate it and if public utilities and administration were functioning normally. Some provision might at least be made to move undamaged machinery and skilled labor if the transportation situation could take it. The problem for the Germans would be made simpler if public morale could be maintained at a high level, but that could be done only if supplies of consumer goods and housing for bombed-out populations could be made readily available. And so it went, a vicious spiral that involved the German authorities in "an ever more acute conflict of priorities."<sup>11</sup> That the optimism here expressed was to a certain extent illusory, stemming from a tendency to underestimate the resiliency of the German economy and the recuperative power of German industry, is a matter of little importance as far as the opinions then shaping the course of the air war are concerned.

The QUADRANT papers are somewhat critical of the counter-air program itself. While admitting that, by forcing the enemy to concentrate a large portion of his air force on the western front in a defensive campaign, the bomber offensive had made a major strategic contribution and that the daylight attacks were actually succeeding in striking the vitals of the German aircraft industry with considerable success, the discussions reflect a distinct feeling of impatience at the slow rate of acceleration in the campaign, especially in the daylight offensive. The chief of the Air Staff, RAF, in a note of 15 August 1943, pointed to the GAF and the industry supporting it, the status of which he considered precarious despite an undoubted expansion in both production and front-line strength. Then, directing his remarks to the question of the American strategic force, which bore the primary responsibility for striking specific installations vital to the German aircraft industry, he went on to note that the Eighth's build-up as required in the CBO Plan was seriously behind schedule. As approved at TRIDENT, that plan called for 1,068 aircraft in the VIII Bomber Command by 15 August 1943; actual strength on that date was 921, including 105 detached for service in North Africa. The Eighth could, he was confident, accomplish the primary POINTBLANK objective of destroying the GAF if given time to build up the necessary force. But time was at a premium. The GAF was in a vulnerable position at the moment, but the opportunity if missed might never recur. He therefore urged "most strongly" that the U.S. chiefs of staff take all practicable steps to in-

crease the striking power of the Eighth Air Force as much as possible during the succeeding two months.<sup>12</sup>

The peculiar urgency attending all official estimates of the CBO at this point derived, of course, from the key position that operation enjoyed in the structure of Allied strategy. It had been set up as a prerequisite to OVERLORD at TRIDENT in May 1943. During the weeks following, when specific plans for OVERLORD were being drawn up, the full import of that decision became clearer. As General Kuter remarked in a meeting of the Joint Chiefs of Staff on 8 July 1943, a successful invasion depended on the air effort exerted against the GAF from that very date: indeed, the effect of POINTBLANK would determine the date of OVERLORD.<sup>13</sup> At the QUADRANT conference, the Combined Chiefs of Staff reaffirmed the decisions made in this respect at TRIDENT and in addition pledged full support to POINTBLANK, as requested by both General Arnold and Air Chief Marshal Portal.<sup>14</sup>

Early in November, the progress of the CBO was again officially examined. In answer to a request from the Combined Chiefs of Staff for re-evaluation of the campaign, a committee appointed by Eaker and Portal reported handsome progress toward the general disorganization of German economy. It spoke confidently again of that "ever more acute conflict of priorities" into which the bombing of industrial cities had plunged the German government: nineteen towns and cities according to photo reconnaissance had been virtually destroyed,\* nineteen others seriously damaged, and nine additional damaged in some lesser degree. Industry as a whole had suffered an estimated 10 per cent total loss. Morale was believed (somewhat optimistically) to have deteriorated to the point where "the general attitude is approaching one of 'peace at any price.' " The report held precision day attacks to be proportionately more effective than area attacks, citing the devastation wrought in the ball-bearing industry at Schweinfurt and the synthetic rubber industry at Hüls. As for the German aircraft industry and the GAF itself, the committee was less confident. Since the summer months, however, RAF Bomber Command had made use of the longer nights to make a more direct contribution to that end by attacking cities of significance to the aircraft industry lying deep in Germany.

\* "Destroyed" was taken to mean damage to a degree which made the objective a liability to the Germans in excess of any remaining assets. "Serious damage" was defined as damage greater than the worst suffered by the United Kingdom—e.g., Coventry.

Damage to fighter aircraft production as a result principally of daylight precision attacks was believed to have been great, amounting to a loss of 880 single-engine fighters since February as the result of raids on assembly factories alone. In addition to the work of the heavy bombers, British and American medium bombers and British fighter-bombers had been employed mainly against enemy airfields and in diversionary attacks timed to relieve the enemy pressure on the heavy bomber formations. Even the bombing of submarine building yards and bases was believed to have been successful to the extent of denying twenty-two U-boats to the enemy. To accomplish all this destruction the strategic bombing forces had been forced to fly from 4 February to 31 October a total of 45,844 night sorties and 15,846 day sorties. Losses over the entire period had been 3.9 per cent for the RAF force and 4.4 per cent for the VIII Bomber Command.<sup>15</sup>

This paper did well enough as a statement of probable achievement to date. The trouble was that those achievements had to be considered always in close relation to the strategic timetable. It was not enough to determine how much damage had been inflicted in relation to the effort expended. The important thing was to determine how near the operation was to achieving its assigned objective within the time allotted; for, although it was in a sense true that the success of POINTBLANK would determine the date of OVERLORD, there was a limit to how long the invasion could be postponed while awaiting the anticipated fatal weakening of the GAF. The target date for OVERLORD had been set for 1 May 1944. Would the CBO have done its work by that time? To this question both British and American planners gave an increasingly pessimistic answer as the weeks passed.<sup>16</sup> In a note to the Combined Chiefs of Staff dated 3 December 1943, Air Chief Marshal Portal stated bluntly that POINTBLANK was at that time a full three months behind schedule.<sup>17</sup>

Time was thus the critical element in air planning during the latter part of 1943. As OVERLORD drew nearer and as the Combined Bomber Offensive gathered momentum (yet insofar as the GAF was concerned with apparently no greater net result than to stimulate the enemy to undertake a prodigious program of expansion), British and American air planners became ever more conscious of the need for accelerating and intensifying the strategic bombing campaign. As was usually the case when the progress of the CBO came under consideration, discussion tended to center mainly on the American force. Its task of



destroying certain industrial plants of vital importance to the enemy was of such consequence to plans for mounting OVERLORD that attention was given chiefly to the problem of increasing the daylight bombing effort. The RAF Bomber Command, on the other hand, was committed to a bombardment policy that promised results of a relatively long-term value (though contemporary observers never wholly gave up hope for an early collapse of German morale), and in addition it had achieved a relatively stabilized effort.

Improvement in the speed and effectiveness of the bomber offensive could be sought in a number of directions. First of all, the operating force could be built up to the level prescribed in the CBO Plan. Secondly, the efficiency of that force could be improved. Then, by revising target directives and by bringing about a closer coordination of effort between British and American forces, the time remaining before OVERLORD could be used to best advantage. Finally, the daylight bombing campaign from the United Kingdom could be supplemented by operations from Mediterranean bases. During the last half of 1943 the solution to the problem was sought in all of the above directions.

There were difficulties in accelerating the build-up of the daylight force. General Arnold heartily indorsed Portal's proposal at QUADRANT to increase the striking power of VIII Bomber Command as much as possible during the next two months but warned that not too much could be expected along this line for some time. Combat crews rather than aircraft were the bottleneck. In order to meet the growing demands of the Eighth Air Force for replacements, training facilities in the United States had been reorganized, a process which, though promising for the future, was costing the Eighth for the time being about two groups. As things stood in August, Eaker had nowhere near enough pilots to fly the aircraft he had available in the theater. Even by December, Arnold declared, the training program would not be able to provide replacements and reinforcements enough to bring the Eighth up to planned strength.<sup>18</sup>

Substantial help could be provided in this situation by preventing further large-scale diversions from the force in the United Kingdom. In the past these had virtually crippled the daylight bombing program, and now in August 1943, General Eisenhower was requesting that the three B-24 groups of the Eighth which were in Africa\* be left there

\* Two groups had been sent down from the United Kingdom primarily for the Ploesti mission. A third, originally destined for the United Kingdom, had been diverted to Africa from the United States.

for use in the forthcoming Italian campaign.<sup>19</sup> This request of Eisenhower's raised a knotty question of priority in which the immediate requirements of a critical tactical situation almost prevailed over the less dramatic needs of strategic bombardment. To Eisenhower the bombers were a mobile offensive weapon with which he could strike a strong blow at the Italian mainland, thus facilitating the invasion of Italy and forwarding the entire European war.<sup>20</sup> To both General Eaker and General Devers the bomber offensive was equally important and in an equally critical condition. Especially during the summer and early fall, when the days were long and the weather relatively promising, every possible bomber should be placed at the disposal of the Eighth Air Force for its daylight bombing operations.<sup>21</sup> With the support of these arguments from the theater, General Arnold was able to convince the U.S. chiefs of staff that the three B-24 groups should revert to the operational control of the Eighth Air Force.<sup>22</sup> During the critical phase of AVALANCHE in September, it became necessary for the Eighth to send down to the Mediterranean a total of eighty B-24's but their stay was of short duration.<sup>23</sup>

Remedy for the problem of diversion, however, was not in itself enough. In mid-November only 65 per cent of the forces originally scheduled for POINTBLANK by that date had been made available. And, as Air Chief Marshal Portal pointed out, that percentage of the force could not be expected to produce a similar percentage of results but rather a considerably smaller proportion.<sup>24</sup> In addition to the slow build-up in bomber forces the daylight bombing campaign also suffered from the sadly retarded build-up of long-range fighters. Not until an adequate force of P-38's and P-51's properly equipped with extra fuel-capacity for long distance flights had been provided would it be practicable to renew the systematic bombing under visual conditions of targets deep in Germany. Unfortunately, General Arnold was in no better position in November than he had been in August to increase the already maximum flow of men and equipment. POINTBLANK having been given "the highest strategic priority" at QUADRANT,<sup>25</sup> Arnold was sending bomber crews and long-range fighters (the two critical items) into the United Kingdom as rapidly as they became available over and above the minimum replacement needs of other operations. In fact, in the category of long-range fighters, he planned to send none whatsoever to other theaters during October, November, and December 1943, despite urgent requests for them. He also urged Portal to make available to the Eighth Air Force some fighters of the P-51 type being pro-

duced for the RAF. Help from that quarter, however, could not be expected before January 1944.<sup>26</sup>

This inability to meet the scheduled build-up explains in no small part a growing concern that the available force should be made to function as efficiently as possible. Since May and June, when the Eighth Air Force began to receive its heavy bombers in considerable numbers, General Arnold had been worried about the rate of operations achieved by this swelling force. It seemed to him and his staff that the relatively rapid build-up taking place in the United Kingdom during that summer should be accompanied by an equally rapid increase in the number of bombers dispatched on major missions.<sup>27</sup> During the month of June, for example, the Eighth had a daily average of 775 bombers assigned but an effective combat strength of only 222. These figures, of course, put the problem in an extreme and misleading form, for many of those aircraft had not yet been delivered to tactical units. The daily average of heavy bombers listed as "on hand in operating tactical units" was only 459, a figure more than double 222. The difference, however, was generally easy enough to explain. For one thing, new units were only gradually becoming fully operational—the daily average of bombers "fully operational" was 287. Evidently the critical item was available trained crews, for although the Eighth had a daily average of 419, the figure for those available was only 222—which thus determined the average effective strength in combat combinations. The difference here could be explained largely by the fact that so many crews were as yet in training status and by the normal loss of crew strength through illness, war weariness, etc.<sup>28</sup>

The picture was, however, far from being as simple as the above statistics would indicate. Availability of both crews and aircraft fluctuated widely from day to day, especially when missions were being flown on several successive days, at which time the loss of planes in action coupled with the very high percentage of battle damage incurred in operations over flak- and fighter-defended areas reduced sharply if temporarily the number of available bombers. Moreover, the statistics listed above, though generally explainable, left plenty of room for specific questions regarding the degrees of difference indicated. Were planes being kept too long in depot for modification before being turned over to tactical units? Was repair of battle-damaged bombers being accomplished as rapidly as possible? Were combat crews being used to their full capacity? These and other questions General Arnold asked with rising insistence during the summer of 1943.

Although, broadly speaking, crews constituted the bottleneck in effective combat strength, Arnold was more concerned with maintenance. No doubt he had in mind the future as well as the present. Crews would eventually be made available: arrangements had been made by June to man combat units with two crews per unit equipment, and by December 1943 availability of crews determined the effective strength for combat to a lesser extent than available aircraft.<sup>29</sup> Faulty maintenance on the other hand could seriously impair the efficiency of even the largest bomber force. General Arnold, of course, had some reason to be critical of maintenance in the United Kingdom. But the situation does not appear to have been so bad as he at times feared, and by fall energetic steps taken to bring about the necessary improvement had made very real progress.\*

Maintenance and the availability of crews were not the only factors affecting the rate and weight of operations. Through the summer, as the operating force increased in strength and the pitch of the air fighting rose, General Arnold became increasingly anxious to see the Eighth send out larger forces more frequently and more consistently against objectives in Germany, especially against the big aircraft factories. He was prompted in his impatience not only by his very understandable desire to see the primary task of the AAF done speedily and decisively; he was also under pressure, as he had been from the beginning of the bomber offensive against Germany, to interpret to military and civilian authorities in the United States the contribution being made by the heavy bombers. Those observers knew that the Eighth was being sent vast numbers of planes and crews. During September, for example, the Eighth reported a daily average of 881 heavy bombers and 661 crews assigned to it. It therefore required some explaining to show why the bomber command was able only once during that month to dispatch a force of more than 400 bombers and during the same period was never able to put more than 330 over the target. During September, also, the Eighth had struck German targets only twice out of the eleven major daylight operations accomplished—this at a time when it appeared to observers in Washington that the GAF was in a critical enough position to be defeated decisively if only the attack could be launched consistently enough and on a large enough scale. As Arnold put it, he hoped to see a whole series of Regensburgs with hundreds of bombers smashing German fighter factories so decisively that the enemy would find it simpler to build new ones than to repair the old ones.<sup>30</sup>

\* See above, pp. 621–30, 657–60.

General Eaker would himself have liked nothing better than to send forces of 500 bombers repeatedly to the aircraft factories in central and southeastern Germany. That and much more was the objective toward which he and his command were striving. But he had also to think of the future. Part of his task was to build up the bomber force to planned strength, and that objective could not always be reconciled with the policy of striking the enemy with everything he had, regardless of the cost.<sup>31</sup>

There were, moreover, certain factors at work in the theater which prevented the full employment of available force against the aircraft industry and related objectives of high priority in the CBO Plan. First of all there was the weather, always a limitation on daylight operations, especially those depending on visual sightings. The September record showed cloud conditions over the target area as the main reason why targets in Germany were attacked only twice during the month. Secondly, the Eighth was frequently called upon to attack targets outside the CBO priority list. Here again the September record proved instructive. Of a total of 3,259 aircraft dispatched by VIII Bomber Command, only 1,571 were sent to CBO objectives. The STARKEY operation took 638. Requests from the British army and navy for attacks on such targets as the port facilities at Nantes and the rocket launching site at Watten had accounted for the dispatch of another 734 bombers.<sup>32</sup>

Solutions were being sought for all these problems. General Eaker started his fall operations with a new team of combat commanders. Brig. Gen. F. L. Anderson had taken over command of the VIII Bomber Command on 1 July. On 3 August, Maj. Gen. William E. Kepner had been given charge of the VIII Fighter Command. Both could be counted on for aggressive leadership. Radar bombing was ready for use by the end of September as a means of breaking the strangle hold that weather had maintained over daylight bombing; the first H<sub>2</sub>S mission took place on the 27th. Although clearly not an instrument for precision attack, H<sub>2</sub>S and its successor, H<sub>2</sub>X, promised to relieve the daylight bombing force from the absolute limitations hitherto imposed on daylight operations by overcast weather conditions. It would now be possible to strike strategic industrial centers even when there was little or no possibility of visual bombing. There were those who were so convinced of the value of blind bombing that they advocated adding to the CBO Plan a frankly stated program of area bombardment, for the winter months at least, which would be similar to and supplementary

to the area bombing campaign being carried on by the RAF. In such a way the rate of air attack against Germany could be greatly accelerated: larger forces could be used more frequently with fewer losses, and a valuable contribution could be made to the progressive undermining of enemy morale and economic organization. Moreover it could all be accomplished with the force available without interfering with CBO precision operations.<sup>33</sup>

### *Revamping the Plan*

There remained the alternative of drastically revising the CBO Plan itself, and during the late summer and the fall of 1943, General Arnold and his air planners turned their attention in this direction with increasing determination. Here again the governing consideration was the brief time left before OVERLORD. But there were additional reasons for dissatisfaction with the CBO Plan as it then stood. Since midyear the submarine menace had been greatly reduced and opinion regarding the effectiveness of bombing submarine bases had become very skeptical. Clearly the GAF, rather than the U-boat fleet, was the objective of first priority. Moreover, the Committee of Operations Analysts had for some time been advocating the addition of the abrasives industry, especially its precision grinding-wheel branch, to the target systems of high priority. The committee had never been happy at the removal of that industry from the list it had proposed as a basis for the CBO Plan; and it had restated its earlier view with added emphasis in a report, dated 18 June 1943, which met with considerable favor.<sup>34</sup>

Revision of the plan in such particulars as these, however, could have been accomplished with less effort than was in the long run expended for that purpose. As a matter of fact, the GAF had been accorded a temporary status as an objective of first priority in the plan as it was set up in June and had been receiving in practice even more attention since that date.\* Consequently, greater significance attaches to another criticism leveled during the fall months by the U.S. planners with rising insistence: in view of the short time remaining before OVERLORD, much of which would be useless for visual bombing of precision targets, the seventy-six targets authorized in the POINTBLANK plan were too many to be decisively attacked and should accordingly be reduced in number. It was clear also that the detailed target lists would have to be revised in order to keep up with the accelerating efforts of

\* See above, pp. 366-67.



the Germans to relocate their vital industrial plants.<sup>35</sup> But a revision of strategic objectives was finally accepted by the CCS only in February 1944, after discussions lasting intermittently since August 1943.<sup>36</sup> Meanwhile adjustments in detailed priorities were apparently being made with ease and effectiveness in the theater by the COPC working in close contact with the chiefs of the American and British forces concerned.\*<sup>37</sup>

It appears, therefore, that a more basic issue was that of coordinating the activities of the Eighth Air Force and RAF Bomber Command and of extending the organization of the strategic offensive to include the Fifteenth Air Force in the Mediterranean. The American air planners, especially those in Washington, were concerned over the highly informal arrangements existing for the coordination of RAF area bombing with the campaign against the specific CBO objectives. In fact, no provision had been made for the employment of the two forces against the same targets.<sup>†38</sup> Such cooperation was assumed, doubtless as a natural outcome of the general (and real) unity of purpose back of the strategic bombing program. In practice the different tactical concepts of the two forces tended to make any very close cooperation on individual targets difficult except in congested industrial areas where the results of area bombing by night would immediately complement the daylight attacks against specific points of importance. It was the prevailing opinion in Washington (an opinion, by the way, which General Eaker did not share)<sup>39</sup> that the RAF had not directed its efforts as consistently as it might toward objectives set forth in the CBO Plan. The suggestion was also made that the British were not supporting POINTBLANK with their fighter force as vigorously as they might.<sup>40</sup> And there were some who suspected that the Eighth Air Force was being seduced from the strict paths outlined in the original directive,<sup>41</sup> an opinion supported, certainly on its face, by a study of the weight of bombs dropped by the Eighth from April to October of 1943 on each type of target.<sup>42</sup>

Much of this criticism arose from the natural impatience of one ally with the strategic and tactical doctrines of another. Still it seemed to American observers that the imminence of the cross-Channel assault placed an undeniable premium on short-term results of the type to be expected from an intensified POINTBLANK rather than on any collapse of German economy and morale that might ultimately reward

\* See above, pp. 374-75.

† See above, pp. 371-72.

the area bombing policy of the RAF,<sup>43</sup> at least insofar as that policy was not directed toward objectives of immediate importance to POINTBLANK. That project had been accepted by the British as a combined effort; it was being carried on under the direction of the chief of Air Staff, RAF, and both forces were working, each in its own way, toward POINTBLANK objectives. But the project had obviously been planned with special reference to the concepts and capabilities of the American force. Now, with time short, American planners hoped for a more detailed and specific type of cooperation. The creation of an additional U.S. air force in the Mediterranean committed to POINTBLANK raised, at the same time, problems of strategic policy and control which made it more difficult for the Allied air planners to agree on the proposed revisions. The British command in October opposed the steps taken to decentralize the strategic bombing effort, preferring for reasons both of strategy and control to have it based in the United Kingdom.\*

So it was that the crisis in the daylight bombing program prompted American air planners to intensify their efforts to revise the strategic bombardment plan with an eye first to extending the bases for attacking German industry and second to securing a more closely integrated POINTBLANK. Those desiderata were very closely related, and it is hard to separate the respective arguments in the planning papers of late 1943. The project for extending the CBO to include operations of an additional strategic force in the Mediterranean involved, however, the more radical alteration in the concept underlying that campaign.

To secure air bases in Italy was one of the objectives of the Allied campaign in that country.<sup>44</sup> In the summer of 1943 the prospect of developing bases in the Foggia area led airmen to explore more specifically the possibilities thereby presented. American air planners, especially Generals Arnold and Spaatz (and in this they received support from General Eisenhower and Air Chief Marshal Tedder), saw in it a rational and profitable way of increasing the effectiveness of the strategic bombing effort. Bases in a Mediterranean climate had interested General Arnold since the fall of 1942, when the weather of northern Europe had seriously disrupted the operations of the infant Eighth Air Force, and the summer and fall months of 1943 brought additional arguments. Operations from Italian bases would split the enemy's defenses, especially his fighter force, and so help reduce the alarming

\* See below, pp. 725-27.

casualty rate being suffered by the Eighth Air Force in its attempts to strike deeper into the heart of the Reich. On this argument General Marshall laid special emphasis during the discussions in October;<sup>45</sup> and it appears to have been a governing consideration in the tentative decision made by the Combined Chiefs of Staff at that time to authorize a strategic air offensive from Italian bases.<sup>46</sup> Not only would such an offensive divert enemy defense forces, both fighter and antiaircraft, from the sadly bedeviled Eighth but that offensive would find the going relatively easy, striking as it would the as yet poorly protected industrial areas of southeast Germany.

In addition the apparently rapid relocation of enemy industries from the heavily bombed northwest to those areas placed tempting targets within reasonable range of Italy-based bombers. The major aircraft manufacturing complexes being concentrated in the Augsburg and Wiener Neustadt areas were particularly important in the counter-air campaign. Nor did the possibilities of close cooperation between strategic forces in Italy and the United Kingdom, involving coordinated attacks and possible shuttle-bombing missions, make the project look any less attractive—from a distance at any rate. Finally, to build up a force in Italy would be to relieve crowded operating conditions in the United Kingdom.<sup>47</sup>

These were the strategic arguments advanced in favor of building up a new U.S. strategic air force in Italy. The fact that a sizable force of heavy bombers was already in the Mediterranean with the Twelfth Air Force and was likely to be diverted to purely tactical purposes unless specifically dedicated to POINTBLANK no doubt helped to convince General Spaatz and General Arnold,<sup>48</sup> although the latter seemed by the fall of 1943 sufficiently dissatisfied with the rate and range of daylight operations from the United Kingdom to seize upon any reasonable plan that would promise substantial improvement in both respects.\*

With the above considerations in mind the JCS early in October considered and approved a plan† drawn up by General Arnold and his staff in conference with General Spaatz, who paid a brief visit to Washington for that purpose, “to assure the most effective exploitation of the CBO” by reorganizing and building up the U.S. strategic air force in the Mediterranean in anticipation of the acquisition of numerous bases in central and southern Italy.<sup>49</sup> The idea was to regroup the air

\* See above, p. 718.

† See above, pp. 564-65.

units of the Twelfth Air Force into two separate air forces, one to remain under the direction of the theater commander for use in connection with tactical operations, the other to be called the Fifteenth Strategic Air Force, composed of heavy bomber and long-range fighter units. This new force would according to the plan also operate under the theater commander but would have its general objectives in connection with POINTBLANK stated from time to time by the CCS and would maintain liaison with the Eighth to insure close cooperation in the CBO. The strength of the Fifteenth would be made up partly from the long-range bomber groups already with the parent organization but would have to be augmented by units drawn from those set up in the Bradley plan for the Eighth. The new force would consist at first of six heavy bomber groups and two long-range fighter groups; by 31 March 1944 it was to have twenty-one heavy bomber and seven long-range fighter groups. As CCS 217/1 this paper was approved by the Combined Chiefs on 22 October with the proviso that, if it became impossible properly to base the full number of aircraft planned, they should be diverted to the United Kingdom.<sup>50</sup>

This proviso was inserted at the suggestion of the British representatives, who were very skeptical regarding the practicability of basing large-scale strategic air operations in Italy until better base facilities could be provided. The British reaction to the Italian plan had been initially favorable. At QUADRANT, Portal had expressed the opinion that Italy would be the key to the bomber offensive, for bases in northern Italy could command all of northern Germany.<sup>51</sup> The plan advocated in October by the JCS, the British appear to have considered premature. Progress in Italy had been slower than anticipated two months earlier.<sup>52</sup> As the implications of the plan became clearer—the drain it would necessarily cause on the forces scheduled for the United Kingdom and the revised system of organization and control which the U.S. chiefs had in mind as a corollary—the British Air Staff opposed the project vigorously.

The opposition voiced by the British on strategic grounds (and in this opposition they were seconded heartily by Generals Eaker and Devers)<sup>53</sup> centered chiefly upon the wholesale diversion of units from the scheduled build-up in the United Kingdom.<sup>54</sup> Air Chief Marshal Portal repeatedly urged that what the bomber offensive required was not so much a revision of basic strategy as a build-up of the American daylight bombing force in the United Kingdom that would approxi-

mate the rate of increase originally scheduled. As it was, that build-up had lagged seriously and half the scheduled force could not be expected to accomplish the task set for the full-sized force, especially now that time was short and results more than ever imperative.<sup>55</sup> The principle of the concentration of force, as Eaker viewed the problem, would in itself dictate the build-up of a larger force in the United Kingdom rather than the weakening of that force by diversion to the Mediterranean.<sup>56</sup>

But also on a number of lesser counts British leaders and General Eaker believed the Italian project a doubtful venture, at least for the time being. First of all there was the fact that actually only a small percentage of the CBO objectives were closer to Italy than to the United Kingdom, and most of these could be attacked from England. The heart of the enemy war machine remained in the west and northwest. As for the reputedly better weather conditions in Italy, that was a factor of minor importance, for the critical factor in daylight attacks had been found to be weather over the target in Germany, not weather in the base area. Advanced techniques of weather forecasting and navigation, they argued, had made the weather in England a secondary problem. Radar bombing was believed to be only in its infancy as a means of extending the effective operating days of the Eighth Air Force. Such advantages as Italy-based forces might have in longer hours of daylight during winter months in the south would be more than counterbalanced by the constant necessity of crossing the Alps when clouds and bad icing conditions up to great heights are common, especially in winter months. The Alps, moreover, constituted a serious obstacle to the safe return of damaged aircraft. Many a bomber had been able to limp home to its English base, losing altitude gradually. The cripple returning to Italy from a mission against south German targets would be forced to expend vital energy in order to clear the mountains and might frequently be unable to make the grade. Unless the neutrality of Switzerland were violated as a matter of policy, most missions to south German targets from Italian bases would necessarily be very roundabout and would require the Germans to defend only a slightly increased air front. For an indefinite period the heavy bomber operations in Italy would be handicapped by inadequate base facilities for maintenance and repair.\*

\* For a different argument see above, pp. 563-65.

It was the opinion of Air Marshal N.H. Bottomley that a year would be needed before a heavy bomber force of the size projected could be economically maintained in Italy, especially in what the Americans would term fourth-echelon repair which required virtually full factory equipment. Base facilities in England, though obviously crowded, had been developed to a high pitch of efficiency and could, in addition to more rapid maintenance, provide such services as radar, weather forecasting, and air-sea rescue in a way that would not be possible in Italy for many months—in fact, not until after the life-and-death struggle with the GAF had been decided. The opponents of the Italian scheme furthermore believed the close coordination of planning and attack between the Eighth and the Fifteenth Air Forces, to which many American planners looked with confidence, to be a mirage. With some accuracy they predicted that the great disparity in operating conditions between one theater and the other would make it difficult for the two forces to act at all frequently in concert, and that necessary last-minute changes would very probably disrupt the most carefully coordinated plans. In short the daylight offensive during the critical months preceding OVERLORD could best remain based in the United Kingdom where all facilities existed and from which the heart of Germany could be most effectively reached and the Luftwaffe forced into decisive battle by a heavy concentration of forces.

Despite objections, plans proceeded on the basis of CCS 217/1, and the Fifteenth Air Force became a reality on 1 November 1943. Its establishment at once raised the question of command for the expanded bomber offensive, a question which evoked further and at times spirited debate. But since this problem was part of the larger and more complex one of organizing the pre-invasion forces in both the European and Mediterranean theaters, it is dealt with in some detail in the following chapter.

Side by side with the discussions concerning command went equally spirited, but somewhat less decisive, talks concerning the targets for the CBO. American planners continued during the fall and winter to urge modification of the CBO Plan. It was principally a problem of reducing the number of CBO targets to those (in particular the ones of importance to the GAF) that could be decisively attacked during the short time remaining before OVERLORD, of including among this number certain target systems within easier reach from Italy than from the United Kingdom, and above all of insuring that all available bombard-



ment, both day- and night-flying, would be employed exclusively against the German aircraft industry.<sup>57</sup> These principles were embodied in a paper presented by the JCS to the CCS on 5 November. British authorities continued to oppose any such specific revision of the CBO not because they disagreed with the general objective of reducing the GAF as a prerequisite to the big invasion but largely, it would seem, because they wished to avoid being committed to an inflexible plan designed clearly to make the effort of the RAF supplementary to that of the U.S. strategic forces. RAF leaders, and General Eaker with them, had from the beginning of this controversy taken the attitude that there was nothing wrong with the directive originally issued, that to provide the forces projected in that directive and to rededicate them to the general objectives stated therein would do all that was necessary to improve the effectiveness of the bomber offensive. Apparent deviations from the original directive by the Eighth Air Force had been dictated by weather conditions, defensive tactics, and other problems of tactical importance rather than by any failure to recognize the importance of CBO objectives. Furthermore, adequate machinery existed in the Air Ministry and in the COPC to revise the detailed priority lists as the occasion arose.

It was in perfect harmony with the traditions of British public life that the British chiefs of staff preferred a system of informal, practical adjustment within the limits set by a general statement of purpose to the inflexibility of a "written constitution." And, although the staff of AC/AS, Plans complained vigorously of the "quasi-political" control of the British bombing effort as a serious obstacle to wholehearted adherence to POINTBLANK, it was apparently the legalism inherent in the American tradition as much as any actual failure of the CBO machinery that led the U.S. chiefs of staff to insist on a formal revision of the CBO Plan.<sup>58</sup>

At the SEXTANT conference in December 1943 the CCS reported to the President and the Prime Minister their agreement "that the present plan for the Combined Bomber Offensive should remain unchanged except for revision of the bombing objectives which should be made periodically."<sup>59</sup> But this agreement settled little and the debate continued.

Meanwhile, the American strategic bombing forces were operating in steadily increasing strength. The Fifteenth Air Force could by the end of the year muster an effective combat strength of six heavy bomber groups and had three more almost ready to start fighting. The Eighth

added to its order of battle one heavy group in November and four more in December, making by the end of that month a total of  $25\frac{3}{4}$  groups. More significant is the fact that the Eighth was able to dispatch forces of over 700 heavy bombers on three occasions in December, whereas only once prior to 15 October had it sent out more than 400.<sup>60</sup> Clearly, the daylight bomber campaign was rapidly assuming proportions that might be considered decisive, especially when coupled with the strategic advantage of bases in Italy.

But, examined through a lens well ground by later events, the daylight operations of late 1943, although unusually heavy, appear to be those of a force attacking targets of secondary importance in the CBO Plan while waiting cautiously for the big opportunity when fine weather would make it possible to return to the heart of Germany and, in a sustained and coordinated attack, to paralyze the industries supporting the GAF. The Eighth Air Force had learned in October that such operations without fighter protection were impossibly costly. Even with long-range fighters they would not be easy; the losses could, in fact, only be justified by decisive results. Plans for this offensive were developed by December, and both the Eighth and the Fifteenth Air Forces were willing to put them into effect at the earliest possible date, even before long-range fighters were available in sufficient numbers to make the task easier. The weather proved uncooperative, however; and for the rest of 1943 the Eighth Air Force confined its activity to targets on or near the German coast and in occupied France and Norway. Few of these targets were high in the POINTBLANK priority scheme. A majority of the attacks were made during cloudy weather with the aid of the new radar-bombing, Pathfinder equipment, which made possible much more frequent missions than ever before but which did not permit precision bombing of given industrial objectives.<sup>61</sup> Nor was the Fifteenth Air Force able to contribute any more decisively to the attainment of POINTBLANK objectives during this period. Except for a spectacular mission to the Messerschmitt works at Wiener Neustadt on 2 November, one day after its formal activation, the Fifteenth was prevented by bad weather, lack of Pathfinder equipment, and shortage of long-range escort from bombing high-priority targets in southern Germany.<sup>62</sup>

The operations of late 1943 are therefore significant on the one hand because of the disastrous experience of October in striking the aircraft industry deep in enemy territory and on the other as a preparatory phase of the smashing attack of February 1944 which for the first time

seriously weakened the power of the GAF to stop the strategic bombardment of Axis Europe and which for that reason may be called the climactic point of the CBO, considered as a counter-air campaign. At the end of 1943 the daylight strategic forces were poised for the final onslaught against the GAF, an assault which had to be completed before the selected vital organs of enemy industry could be made to feel the full effect of the daylight attack. Viewed in retrospect, the preceding sixteen months of bombing by the American forces become a long period of preparation.

Not that the daylight offensive had been negligible in terms of strategic effects. Together with the devastating attacks made by the RAF against urban industrial areas, that offensive had reduced the cushion of potential productive capacity which had at first absorbed the shock of strategic bombardment. Before 1944, German industry was not fully mobilized. Most industries had surplus plant space, machine tools, and stocks of raw materials. Many plants had yet to be converted to war production. The productive capabilities of occupied countries had yet to be fully developed. The production program had not yet been wholly converted from a quality to a quantity basis. And the enormous recuperative power of the German industry had not been taxed to the full. By the end of 1943 this cushion had been so seriously reduced that the large-scale bombing of 1944 was able for the first time to undermine the enemy's ability to wage war. But the fact remains that, compared to the weight of attack delivered in 1944, the daylight bombing campaign in 1943 must be considered light and indecisive. Especially compelling is the fact that the GAF continued to expand its fighter force despite all efforts made during 1943 to stop it.<sup>63</sup>

That year had been an important one in the history of strategic bombardment; but from the point of view of the daylight force the importance had been tactical rather than strategic. The Americans had pioneered in a new and exacting type of offensive. They had had to learn many lessons—how to drop bombs accurately in unnerving circumstances, how to cope with some of the most perverse weather in Europe, above all how to outwit the Luftwaffe. These lessons they learned so well that they were able during the following year to apply themselves to the task of large-scale bombing with a minimum of confusion and experimentation. On both strategic and tactical grounds it would be true to say that the record of the American heavy bomber forces in Europe for 1943 must be evaluated principally in terms of what took place in 1944.

# SECTION V

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## *FINAL REORGANIZATION*



## CHAPTER 22

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### *FINAL REORGANIZATION*

WHILE planning an all-out air attack on Germany as the prelude to OVERLORD, AAF and RAF leaders struggled with complex questions of command. The issues which developed, although not always openly acknowledged, stemmed partly from considerations of national policy and prestige and were bound up with the over-all problem of the control of Anglo-American forces then being assembled for the invasion of western Europe.

During 1942 and the early part of 1943, British counsel on strategy in the war against the European Axis had tended to prevail at meetings of the Combined Chiefs of Staff. Britain's experience and greater state of preparedness, the result of having been at war for more than two years longer than the United States, lent weight to British opinion. In general, the American position on strategy had been less concerned with ultimate political and economic aims than was the British view. The Joint Chiefs of Staff had consistently favored an invasion of western Europe as the quickest and surest means of relieving pressure on the U.S.S.R. and bringing the war to a decisive conclusion. To this proposal the British had seemed at best lukewarm, and they showed a preference for exploiting the initial Allied victories in the Mediterranean, a fact American leaders were inclined to attribute to Churchill's influence in the interest of British political policy in Europe.<sup>1</sup> It would be difficult to prove that Anglo-American strategy in the European war should have been otherwise than it was, for an invasion of western Europe in 1942 or 1943 would have been far more of a gamble than it proved to be in 1944. But the differences in strategic outlook naturally colored the views of both nations on the subject of the command of the combined forces for OVERLORD.

With reference to such earlier plans for the invasion of western



Europe as SLEDGEHAMMER, ROUNDUP, and the plan ordered at Casablanca to be prepared for the eventuality of an unexpected collapse of Germany, it had been assumed that a British officer would command the invading Allied forces, since the British would have to contribute the major part of the forces. By the summer of 1943, however, American production and manpower were coming into full play, not only to lend weight to the strategic views of the Joint Chiefs but to argue for the selection of an American as the supreme commander. When Roosevelt and Churchill met with the Combined Chiefs in the QUADRANT conference at Quebec in August it was obvious that the bulk of the ground and air forces to be committed to OVERLORD would be American. Accordingly, Churchill agreed that the supreme command should go to an American, with combined air and naval commanders responsible to him. The question of a separate combined command of ground forces under the supreme commander was left in abeyance.<sup>2</sup>

The decision at Quebec represented a major concession by the British. Long accustomed to the dominant role in the world, with interests in Europe outmeasuring those of the United States, and with some reason to feel that a greater experience in European affairs lent special qualifications to her leaders, Britain could have been pardoned a feeling that the supreme command belonged to her. For the nation which had stood so long in the front line, which had experienced the black days of Dunkirk, and which would now provide the springboard for the invasion, it must have been difficult to accept any but the leading role in the liberation of Europe. And having yielded on the supreme command, the British enjoyed a natural advantage in the choice of subordinate commanders.

This was particularly true in the case of the air command, for the RAF held advantages of its own. It had been an independent air force since 1918, and thus for a quarter of a century had occupied a position in its nation's defense superior to any yet achieved by the AAF. The Battle of Britain had raised its prestige to a high level and, after an uncertain beginning, the strategic bombardment of Germany by the RAF Bomber Command had captured the imagination and hope of the Allied world. Only with difficulty had the AAF fought off repeated suggestions, coming as frequently from American as from British sources, that it surrender its own tactical principles to join with RAF Bomber Command in an expanded campaign of night bombardment. Since Jan-

uary 1943, Sir Charles Portal had served as the representative of the Combined Chiefs of Staff for the over-all direction of CBO operations. The very nature of air operations imposed upon the Americans a special dependence on British bases, and that dependence would be affected to a lesser degree than with other arms by the movement of the assault forces onto the continent.

But if the AAF had been theretofore the junior partner in the air war against Germany, it promised soon to outgrow its colleague. It was clear by the summer of 1943 that the AAF would play an equal or even a dominant role in the scheduled invasion of Europe. Moreover, the AAF was young, aggressive, and conscious of its growing power. It was guided by the sense of a special mission to perform. It had to justify the expenditure of billions of dollars and the use of almost a third of the Army's manpower. It had called off for the duration of the war earlier campaigns for an independent status, but it knew full well that its position in the postwar organization of national defense would depend upon the record now to be established. It sought for itself, therefore, both as free a hand as possible to prosecute the air war in accordance with its own ideas and the maximum credit for its achievements. Under these circumstances it was too much to expect that all questions could be resolved to the complete satisfaction of either the AAF or the RAF.

### *Allied Expeditionary Air Force*

A small Anglo-American air staff had been established at Norfolk House under Air Marshal Sir Trafford Leigh-Mallory in June for collaboration with General Morgan as COSSAC in the drafting of plans for OVERLORD. Leigh-Mallory had commanded a fighter group during the Battle of Britain, and late in 1942 he had been elevated to the command of RAF Fighter Command. Upon receiving the additional assignment to the Norfolk House planning group in June, he had moved promptly to convert a large part of RAF Fighter Command, which heretofore had operated as a static organization for the air defense of Britain, into a tactical air force possessed of the requisite mobility for support of the scheduled expedition into Europe. And when at Quebec, in August, Sir Charles Portal urged the immediate designation of an air commander for the invasion, Leigh-Mallory received the assignment.<sup>3</sup>

Events soon proved, however, that it had been easier to agree on the designation of the tactical air commander than it was to reach an un-

derstanding on the extent of his authority. The headquarters of the Allied Expeditionary Air Force would not be activated until mid-November and still another month would elapse before it enjoyed any control whatsoever over the Ninth Air Force, which was established in England in October as the American component of the expeditionary air force. The AAF adhered to the policy of reserving to itself as much control as possible over its air units by granting to the projected AEAF only operational control of the American tactical air force. As Eaker put it in September, as far as the Americans were concerned, Leigh-Mallory would command "only the Ninth Air Force Commander, and not our soldiers and individual units contained therein."<sup>4</sup> Portal, presenting the British view, felt that "it would be a great mistake to divorce administration from the other functions of Command. . . . One of Air Marshal Leigh-Mallory's responsibilities will be to make administrative plans and preparations for the move across the channel and I do not believe that this will be possible if he is not to assume full administrative control until his forces are established on the Continent."<sup>5</sup> But some Americans felt that there was a desire on the part of the British to exercise undue control of American air units, presumably in the interest of British prestige, and this they were not disposed to permit.<sup>6</sup>

By early September both Arnold and Portal had drawn up draft directives for the air commander which further clarified the conflicting national views. Subsequent interpretations by others, especially those by Eaker, Devers, and Leigh-Mallory, followed the lines laid down in these two drafts. Different usages of terminology occasioned some difficulty. The RAF term "administration" included what the Americans called "logistics," and this broader usage caused some additional apprehension.<sup>7</sup>

Arnold, Eaker, and Devers agreed that the directive to Leigh-Mallory should limit his powers to "tactical coordination and control." They opposed administrative control of the Ninth Air Force by a combined headquarters, arguing that the administrative channels of the armed forces of the two nations had theretofore remained separate and that substantial differences between the two administrative systems made it undesirable for officers of either the RAF or the AAF to exercise anything more than operational control over forces not of their own nationality.<sup>8</sup> The Americans could point to the CCS decision of 1942 that a combined commander did not have power "to control the administration and discipline of any force of the United Nations com-

prising his command," beyond that "necessary for effective control."<sup>9</sup> But this last phrase unhappily was vague enough to become the nub of the disagreement.

Having developed a complete administrative and logistical system of their own in the European theater and being convinced that the establishment of another administrative channel would serve to strengthen RAF controls, the Americans elected to meet the threat by indirection as well as by direct argument. Both Arnold and Eaker stressed the desirability of creating for Leigh-Mallory a small headquarters and pleaded that the AAF did not have the officers to staff a large one, an argument which certainly had some support in fact. Eaker pointed out that if a large headquarters were created with the full powers desired by the British, it would be 75 to 80 per cent British because of the inability of the Americans to provide an equal share of the staff. In such an event, the RAF would inevitably dominate the headquarters and British plans and policies would prevail. The British practice of assigning officers of superior quality to combined headquarters staffs and of always matching or exceeding in rank the American portion of the staff lent weight to Eaker's opinion. Experience argued that with RAF officers enjoying the advantage of one or two ranks over their opposite American numbers the latter would play a subordinate part.<sup>10</sup>

The Americans seem also to have been influenced in part by the British attitude toward proposals for bringing all air forces engaged in the strategic bombardment of Germany under one command. It will be recalled that, in December 1942, General Arnold had proposed an over-all air command for Europe and Africa. A number of circumstances had combined to prevent serious consideration of the proposal, among them an apparent disinclination on the part of the RAF to endanger the integrity of its bombing operations under an existing arrangement which made the Bomber Command responsible directly to the Air Ministry and the Prime Minister. Revival of this proposal in the fall of 1943, together with an alternate proposal for a strategic air command to balance the tactical, brought a flat refusal to consider placing Bomber Command either under an over-all air command for the European and Mediterranean theaters or under an over-all command of the strategic air forces. For the time being, at least, the British even refused to agree that Bomber Command would come under the supreme commander for OVERLORD. British persistence at Cairo in November and December left an impression among the Americans of a purpose not only to

protect the independence of Bomber Command but to retain insofar as was possible strategic direction of the war in the Mediterranean, where British interests were great and where it had been agreed a British officer would succeed Eisenhower.<sup>11</sup> Not until the spring of 1944 would the thorny question of control of strategic air forces to be employed in connection with the invasion reach a final settlement.

For so long as that question remained unsettled it naturally served to complicate the debate over control of the tactical air forces. Indeed, it had been in no small part Arnold's fear that Leigh-Mallory might seek to draw under his control strategic as well as tactical forces which had prompted the proposal in the fall of 1943 that there be a strategic air commander in addition to the tactical; as advanced by the Joint Staff Planners, both commands would come under the control of the supreme commander at an appropriate time.<sup>12</sup> The question was not merely one of the control to be exercised over the heavy bombers during the course of the actual invasion. AAF leaders found in Leigh-Mallory's insistence that the launching of OVERLORD did not depend upon the successful completion of POINTBLANK the threat of a premature diversion of their forces from the bomber offensive.<sup>13</sup> Leigh-Mallory, who came to Washington early in November to speed the issuance of his directive, vigorously opposed the American draft as "unacceptable . . . in so far as it provided for both a strategic air commander and a tactical air commander under the control of the S.A.C."<sup>14</sup> He felt that there should be only one air commander in chief for the operation and submitted a memorandum for consideration by the Combined Planners. His argument naturally served to confirm the suspicions of AAF officers.

Agreement on Leigh-Mallory's directive was reached by mid-November. The Joint Staff Planners had objected that the British draft failed to limit sufficiently the "command functions of the Air Commander in Chief, A.E.A.F., with respect to the Ninth Air Force," and proposed that the transfer even of operational control of the Ninth to the new headquarters should be delayed in order that the medium bombers assigned to that air force might continue to help the Eighth in its strategic bombing. It was agreed that the air defense of the British Isles should come under AEAFF.<sup>15</sup> On the initiative of the Americans, who perhaps wished to emphasize the subordinate position of the new command, the directive was sent to COSSAC for issuance to Leigh-Mallory. General Morgan sent it down on 16 November.<sup>16</sup>

That directive named Leigh-Mallory air commander in chief, Allied Expeditionary Air Force under the supreme commander and gave him operational control over the British and American tactical air forces committed to OVERLORD. The RAF Tactical Air Force and the Air Defence of Great Britain, both of which organizations had been formed from the RAF Fighter Command, came under Leigh-Mallory's control at once; the Ninth Air Force would pass to that control on 15 December. Prior to the invasion the AEF would lend maximum support to the strategic air offensive. An American officer would be appointed deputy air commander, and AEF would interpret its powers in accordance with CCS 75/3. In other words, the administrative and disciplinary powers of the commander over U.S. forces under his control would be limited to those "necessary for effective control."<sup>17</sup>

An embryonic headquarters for AEF had existed at Norfolk House since the summer. Maj. Gen. William O. Butler, former commander of the Eleventh Air Force in Alaska, was named on 17 November as deputy commander. Leigh-Mallory established his headquarters at Stanmore (former RAF Fighter Command headquarters located about a dozen miles northwest of the center of London), but offices were also retained in Norfolk House, where the closely coordinated planning of air, ground, and naval staffs continued to be concentrated under the direction of COSSAC.<sup>18</sup> The new commander assumed administrative control of the RAF units assigned to the AEF on 17 November.<sup>19</sup> AEF units after passing to the control of AEF would remain administratively responsible to the appropriate American headquarters, which currently was the United States Army Air Forces in the United Kingdom.

Provision of a definite number of American officers and men for the new headquarters was not made until December. On 18 December the American Component, Allied Expeditionary Air Force, was activated and assigned to the theater with a strength of 66 officers and 123 enlisted men, a strength about half that of the RAF component. General Butler had requested a larger number and COSSAC had indorsed the request, but no action resulted.<sup>20</sup> Indeed, it became settled AEF policy to keep its side of AEF headquarters small, as though thus to minimize its importance, but this tactic did not prevent the building of AEF into a headquarters that by February 1944 would include some 250 RAF officers. It was admitted, of course, that the administrative responsibilities held by AEF for RAF organizations provided some warrant for



this growth, but the Americans suspected a purpose to build up the only combined air headquarters then in existence to a point at which it might logically be argued that it alone was equipped to exercise a common command of the tactical and strategic air forces. This suspicion had become conviction by the following February, at least in the minds of some U.S. officers who advised an abrupt about-face from previous policy by strengthening the American component lest the worst come to pass.<sup>21</sup> A small increase was subsequently authorized,<sup>22</sup> but after it had been agreed in March that the strategic air commanders would separately answer to the supreme commander during the period of invasion, AEAFF's demands for personnel came again to be regarded with the old indifference.

Leigh-Mallory conceived his chief functions to be to advise the supreme commander and his staff on air operations, to prepare the air plan for the invasion operation, to supervise the training of the tactical air forces, and to direct the tactical air forces in combat operations. To carry out these functions he organized his headquarters according to the RAF pattern. There were two main sections of the staff—the air staff and the administrative staff. The former, corresponding to the American A-2 and A-3 staff sections, was a combined staff, where British and American officers worked together closely in the collection of intelligence data, the preparation of plans, and the direction of operations. The administrative staff, on the other hand, was not a combined staff; it remained separated into American and British sections. The RAF side of this equivalent of the American A-1 and A-4 sections controlled the administration of the RAF units under the AEAFF, while the U.S. side served merely to pass on necessary information to the Ninth Air Force. Leigh-Mallory's statement of policy indicated that because of the "high degree of integration of service elements into the Ninth Air Force the issuance by AEAFF headquarters of administrative instructions to the Ninth Air Force regarding organization, movement, maintenance, supply, etc. will be the exception and not the rule."<sup>23</sup>

### *The Theater Air Force Again*

The issue of a strategic air command had not been raised solely, or even primarily, for the advantage it seemed to offer with reference to the position and power of AEAFF. Proposals for such a command stemmed partly from a growing concern over the lagging Combined Bomber Offensive and the desire to strengthen it in all possible ways.

It will be remembered that the CBO had been placed originally under the general strategic supervision of the chief of Air Staff, RAF, as deputy for the CCS, with whom the ultimate responsibility remained. Coordination of effort between the Eighth Air Force and RAF Bomber Command had been effected initially for the most part by the informal and intimate liaison maintained by the commanders concerned. More recently the Combined Operational Planning Committee, comprising representatives of the RAF's bomber and fighter commands and the Eighth Air Force, had been established for the purpose. In the fall of 1943 this committee was presided over by Brig. Gen. Orvil A. Anderson of the Eighth Air Force. Since the system in its actual operation exercised an effect chiefly on American operations, there was some feeling that a strategic air command embracing RAF and AAF bomber forces might better achieve the needed coordination of effort on POINTBLANK objectives.<sup>24</sup> This feeling seems to have been held more strongly in Washington than in the theater.

In the theater AAF leaders, being reasonably content with the existing machinery for coordination of strategic operations with the RAF, paid closer attention to the problem of bringing the newly established Fifteenth Air Force into an effective system of control. This was also a subject of special concern to AAF Headquarters, which had taken the initiative in establishing the Fifteenth and looked forward, as at earlier dates, to closely coordinated operations between the United Kingdom and the Mediterranean which would exploit fully the flexibility inherent in the strategic air arm. According to a CCS directive the new force was to be used primarily in connection with POINTBLANK,<sup>25</sup> but grave risk existed that under pressure of tactical circumstances the force might be diverted from its major mission unless placed directly within the command machinery established for the CBO.<sup>26</sup> Planners were also concerned with the shifting of forces from one theater to another as the strategic situation required. There was talk of shuttle bombing and interchangeable use of bases between the Eighth and the Fifteenth. All of this would require unity of command rather than the liaison provided for in the establishment of the new air force.<sup>27</sup>

Accordingly, the U.S. chiefs of staff on 18 November 1943 placed a plan before the CCS to establish in the United Kingdom the U.S. Strategic Air Forces in Europe (USSAFE) for control of the operations of the Eighth and Fifteenth Air Forces. General Spaatz, it was indicated,

would command this higher headquarters, and until such time as his command came directly under the supreme Allied commander, he would be responsible to the CCS and required to coordinate with the RAF through the chief of Air Staff, RAF.<sup>23</sup>

There were of course other if secondary considerations dictating the proposed course of action. General Arnold later admitted that a governing consideration had been the desire to build up an American air commander to a position with prestige comparable to that currently enjoyed by Air Chief Marshal Harris of RAF Bomber Command and General Eisenhower.<sup>29</sup> And more fundamental, especially in their effect on the final organization of the new headquarters, were logistical and administrative considerations of the first importance. The organization and proper position of the logistical arm had long been a subject of debate in the Army and in the AAF. The demands of a war of machines fought over the whole face of the earth had dramatized as never before the importance of the essentially undramatic functions of transportation, supply, and maintenance and lent new strength to calls for centralization of responsibility. The service command had been a major problem of the Eighth Air Force since its establishment, and the anxious examination of the factors affecting the rate of bombing operations in the fall of 1943 had emphasized anew the basic importance of its varied functions.

If as a result of these investigations there were those who felt that the service command should be strengthened, that command itself was nowise loath to point out what should be done. On 24 October 1943, General Knerr became commanding general of VIII Air Force Service Command, succeeding General Miller, who took over the IX Air Force Service Command. Since the preceding July, when he assumed the duties of deputy commander of the service command, Knerr had pressed for a reorganization of the Eighth Air Force that would place logistics on the same level with combat operations.

Eighth Air Force organization had followed convention in placing the service command in a position subordinate to a headquarters staff in which an A-4 advised the commanding general on logistical problems, with a resulting conflict at times between staff office and operating agency. As a member of the Bradley committee in the spring of 1943, Knerr had prepared a special report on air service in Africa in which he advocated the elimination of this problem by the simple expedient of elevating the operating agency to the staff level of command. A-4 and

service command headquarters should be consolidated, and an air force headquarters should be organized around two deputies—one for operations and one for maintenance—"such deputies to execute a primary command function within their jurisdiction in execution of the Air Force Commander's decisions and policies." Knerr believed that a great amount of staff work and time could be saved if the air force commander and his two deputies, "in close personal contact and conversant with basic policies, could make major decisions on the spot as the rapidly changing situation of air warfare demands." He further argued that all service commands should be redesignated maintenance commands to escape the implication of subservience which went with the term "service."<sup>30</sup>

These ideas were embodied in specific recommendations for General Miller's attention immediately after Knerr's appointment as deputy commander of the service command. Miller forwarded the proposals to Eaker on 30 July, and these were followed in September by a detailed plan.<sup>31</sup> According to Knerr, as "difficulties developed in connection with A-4," General Eaker "gradually came around to the agreement that it would be better to consolidate A-4 and Service Command in one person, particularly since the headquarters were practically in the same building."<sup>32</sup> On 11 October, therefore, Knerr was appointed A-4 of the Eighth Air Force. Although nominally still deputy commander of the service command, Knerr had known since mid-September that he would succeed Miller as commander.<sup>33</sup> When this occurred in October, Knerr combined in one person the chief air service offices of the air force. By December the service command had absorbed the personnel and functions of A-4 to become in effect the sole logistical agency entitled to act in the name of the commanding general, Eighth Air Force.<sup>34</sup>

In his further efforts to centralize the responsibility for logistics, Knerr was aided by the course of events. The re-establishment of the Ninth Air Force in England had raised a question of the extent to which the provision of service and maintenance for the new air force should duplicate the already existing establishment—of how far the AAF should go toward maintaining two separate and independent service organizations. That question had been answered tentatively by the activation of the United States Army Air Forces in the United Kingdom as a theater air headquarters. Since the staff of this new headquarters was one and the same with the Eighth Air Force, General Knerr as

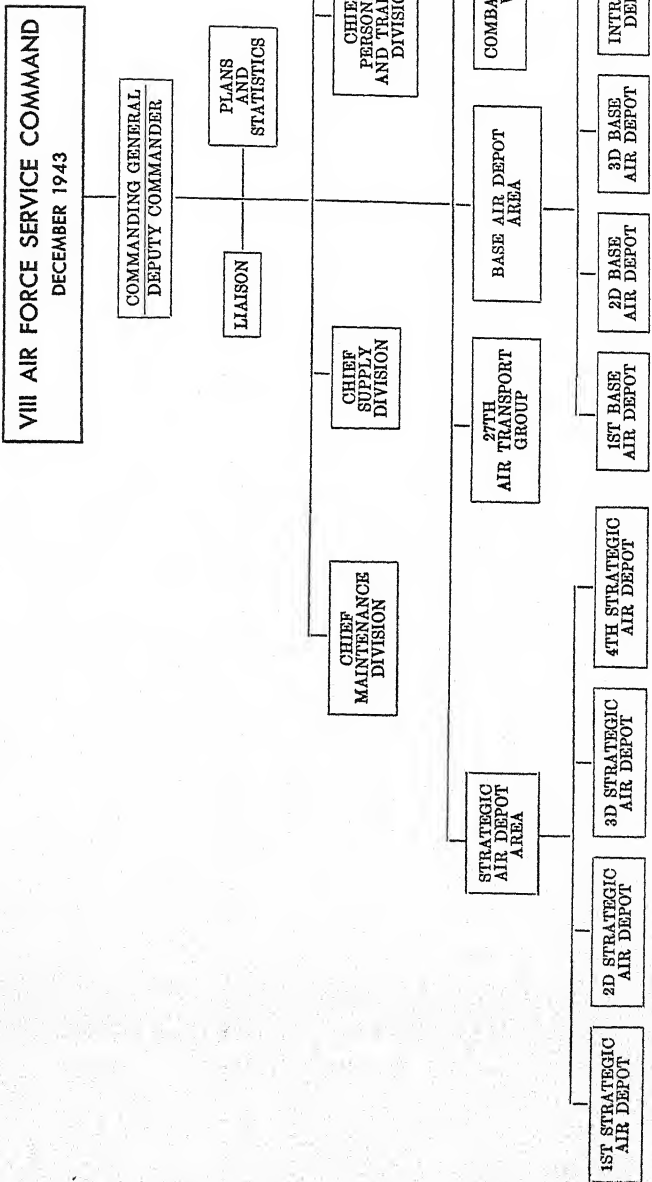
A-4 of the Eighth automatically became A-4 of USAAFUK and thus chief adviser to the theater air commander on questions of logistical organization. From the first he vigorously opposed unnecessary duplication.

Of necessity the VIII Air Force Service Command after the establishment of the Ninth Air Force functioned as a *de facto* theater service command, and its policies were shaped during the last weeks of 1943 by the assumption that it would be officially so designated. At the same time, air service headquarters looked forward to full integration with the highest air headquarters. Developments within the service command since summer, it will be recalled, had tended to divest the headquarters of direct control over operations and thus to shape it as an organization primarily responsible for policy.<sup>35</sup> Increasingly, as operating responsibilities were transferred to the Base Air Depot Area, air service headquarters prepared itself to operate chiefly as a staff agency for the entire theater.

General Knerr recommended to Eaker the reorganization of USAAFUK with the two deputies for operations and for administration which he had proposed in his report on Africa.<sup>36</sup> Recommendations by others advocated that Eaker separate himself from the Eighth Air Force to devote full time to a theater command with a small but strong headquarters staff. Attention was called to the growing competition between the Eighth and Ninth Air Forces, to the latter's tendency to duplicate almost all of the services provided by VIII Air Force Service Command (including the base depots), and to the apparent need for a theater air service command for "over-all planning, procurement and to supervise the operation of the Base Air Depot Area which should serve both Air Forces."<sup>37</sup> Except for the appointment in late November of Maj. Gen. Idwal H. Edwards as deputy commander,<sup>38</sup> however, Eaker waited for the final settlement of a variety of related command problems then under consideration.

### *Mediterranean Allied Air Forces*

Pertinent to any decision that General Eaker might have made on proposals for reorganization in ETO were developments which in the end would bring about his own transfer to the Mediterranean simultaneously with Spaatz' return to the top command in the United Kingdom. The decision to divert fifteen heavy bomber groups, formerly scheduled for the Eighth Air Force, to the Fifteenth and to use them





against POINTBLANK targets in close coordination with operations from England lent special importance to the question of the air command in the Mediterranean. Not only would the desired coordination with the new strategic command in ETO depend upon a close understanding between the commanders primarily concerned but the necessity, for administrative and other reasons, of fitting the Italy-based strategic force into the complex organization of Allied forces in the Mediterranean made General Eaker a most likely choice for a difficult assignment. Particularly important was the need for an AAF officer of high rank and proved ability in the diplomacy of combined operations to take the command of the projected Mediterranean Allied Air Forces.

The advance of the Allied forces from Africa to Sicily and then to Italy had made necessary several adjustments of organization and jurisdiction. It was felt that there should be one supreme command for the whole of the Mediterranean, and that the air forces should be similarly united so as to insure full coordination of the theater's far-flung air elements. There had been, of course, Mediterranean Air Command under Tedder since the preceding February. But this command had existed primarily for the coordination of operations among Northwest African and Middle East air forces, and with the increasing consolidation of these forces for all practical purposes, there had arisen a question as to the advantage in maintaining two such headquarters as MAC and NAAF when one headquarters might serve well enough. Early in December, at the SEXTANT conference in Cairo the British chiefs of staff proposed to extend the responsibility of the commander in chief of Allied Force to include the Balkans, the Aegean Islands, and Turkey and to make him in effect commander of the Mediterranean area. At the same time it was proposed, on Tedder's recommendation, that MAC be redesignated Mediterranean Allied Air Forces on the understanding that it would absorb the functions theretofore exercised by NAAF headquarters. Among the arguments advanced for the latter proposal, some of them attributed to Doolittle, were the inappropriateness of the current designation for the ranking air headquarters and the fact that under that name it had come to be identified as a British organization to the detriment of Anglo-American good will. Of greater weight were the advantages to be gained by consolidating MAC and NAAF.<sup>39</sup>

The Combined Chiefs, having accepted the proposals, on 5 December issued a comprehensive directive for the organization of "a unified

command" in the Mediterranean.<sup>40</sup> This paper placed air and sea commanders on the same level with the commanding general of the 15th Army Group under the commander in chief of Allied Force. MAAF would direct operations through a single combined operational staff for the assurance of true unity in planning and action by its AAF and RAF elements. For purposes of administration, however, the headquarters would be divided into three staffs headed respectively by a deputy air commander in chief (United States), a deputy air commander in chief (British), and an air officer commanding in chief (Middle East). Thus each of the three elements would control its own administration as its organization or position might require. To facilitate the administration of American units, now divided between the Twelfth and Fifteenth Air Forces, the United States Army Air Forces, North African Theater of Operations was created (USAAF/NATO).

The CCS had agreed that the new organization of Allied forces in the Mediterranean should become effective on 10 December 1943. Actually MAAF was not activated until ten days later, but as of 10 December.<sup>41</sup> Under it, which is to say under the air commander in chief, Mediterranean, fell all air organizations in that area: USAAF/NATO, all RAF elements including RAF, Malta and RAF, Middle East,\* French and Italian units operating within the area, and such other forces as might later be assigned to it.<sup>42</sup> The CCS had directed that the commander in chief, Allied Force should furnish the Fifteenth Air Force with necessary logistical and administrative support "in performance of Operation POINTBLANK as the air operation of first priority." In the event of "a strategic or tactical emergency," he might at his discretion use the Fifteenth for purposes other than its primary mission on the condition that he inform the CCS "and the Commanding General, U.S. Strategic Air Forces in Europe, if and when that command is organized."<sup>43</sup> Tedder on 20 December became air commander in chief with Spaatz as his operational deputy. The latter on that same day assumed the duties of commanding general, USAAF/NATO.<sup>44</sup> It was understood, however, that these assignments were temporary. In fact, a final decision on the transfer of Spaatz to

\* Middle East now ceased to operate as an autonomous area. U.S. Army Forces in the Middle East (USAFIME) came under the operational control of the commander in chief, Mediterranean, for such operations as might be conducted in the eastern Mediterranean, the Balkans, or Turkey but remained responsible to the War Department for other functions assigned to it. It will be recalled that the Ninth Air Force, combat air element of USAFIME, had been transferred to the United Kingdom with its combat units going to the Twelfth Air Force.

England and the reassignment of Eaker to the command of MAAF had already been reached.

At Cairo, on 5 December, Roosevelt had decided on Eisenhower as the supreme Allied commander for OVERLORD.<sup>45</sup> General Marshall, who up to the last minute had been considered the most likely choice, would remain as U.S. Chief of Staff, a position in which he was regarded by the President as indispensable. Eisenhower received notification of his new assignment from Marshall on 7 December.<sup>46</sup>

On that same day, the Combined Chiefs accepted the American plan for a strategic air command to coordinate the operations of the Eighth and Fifteenth Air Forces.<sup>47</sup> The British chiefs had vigorously objected to the proposal. The plan took the daylight bombing forces out of the province of the chief of Air Staff, RAF, as coordinating agent of the CCS, and thus in the British view destroyed, without compensating advantages, existing arrangements for close liaison between AAF and RAF leaders. The British chiefs admitted that the possibility of switching heavy bombers between theaters was "attractive" but argued that the plan was unrealistic, given existing base and maintenance facilities in Italy. In response to these objections, the U.S. chiefs agreed that Portal should continue to act for the CCS pending a further decision on control of all strategic air forces in connection with OVERLORD. Under Portal's direction, the American air commander would be responsible for the determination of POINTBLANK target priorities for the Eighth and Fifteenth Air Forces and for the techniques and tactics employed by them. He would have authority to move units of either force between the two theaters within the limits of available base area facilities and would keep the Allied commander in chief in the Mediterranean informed of his general plans and requirements. In an emergency the respective theater commanders would be empowered at their discretion to use the strategic air forces for purposes other than POINTBLANK.<sup>48</sup>

Without agreeing in principle, the British chiefs of staff accepted the amended plan as one applying primarily to U.S. forces, and Portal agreed to carry out the duties of general coordinator of CBO operations with which he remained intrusted.<sup>49</sup> The establishment of the new strategic air command thus did not materially alter the general principle of strategic control originally established for the CBO. A new headquarters would be interposed between the operating forces and the chief of

Air Staff, RAF and would become the interpreter of over-all strategic policy for those forces.

On 8 December, the day after the decision on the new command, General Arnold personally conveyed the news to Spaatz, together with the information that Spaatz would command the U.S. Strategic Air Forces in Europe.<sup>50</sup> It had been generally assumed since mid-November that he would be selected. Senior to Eaker and from the first of the war to its end at Nagasaki regarded by Arnold as his top combat commander, Spaatz was the natural choice for leader in the climactic operations against Germany. The selection at Cairo of Eisenhower, with whom Spaatz had worked in close and effective association since before the invasion of North Africa, provided whatever additional argument may have been required.

Arnold discussed the reorganization with Spaatz and his commanders on the 9th. General Spaatz expressed the hope that he might take his staff with him to England and recommended that Eaker be brought to the Mediterranean as air commander in chief, that Doolittle take over the Eighth Air Force, and that Cannon succeed Spaatz in command of the Twelfth.<sup>51</sup> This slate, with the addition of Maj. Gen. Nathan F. Twining for the command of the Fifteenth, proved to be the one finally adopted.

Following his return to Washington, Arnold notified Eaker on 18 December of the command assignments agreed upon as a result of the organizational changes made at Cairo.<sup>52</sup> It had been decided by that date that Tedder would leave the Mediterranean to become Eisenhower's deputy; a British officer, Gen. Sir Henry Maitland Wilson, would succeed Eisenhower in the Mediterranean. With the MAAF command allotted to the Americans, the situation required, as Arnold pointed out to Eaker, a man especially qualified by experience and ability. General Arnold's message emphasized Eaker's successful handling of relations with the British.

Eaker himself had hoped that he might remain in command of the Eighth under Spaatz. As he said to Arnold in a message of 19 December, it was "heartbreaking to leave just before the climax."<sup>53</sup> On the same day he sought by radio to ascertain Spaatz' views on that possibility.<sup>54</sup> There were others—particularly Devers—who felt that Eaker should remain with the Eighth Air Force.<sup>55</sup> Eaker's long experience in England and Doolittle's experience in Northwest Africa and the Mediterranean naturally suggested a reversal of the proposed assignments for the two

## THE ARMY AIR FORCES IN WORLD WAR II

men. But Arnold and Spaatz were agreed that Eaker could render greater service as air commander in the Mediterranean.<sup>56</sup> On 22 December, The Adjutant General issued the necessary orders.<sup>57</sup> If Arnold's dissatisfaction over the rate of Eighth Air Force operations entered into the decision, the record apparently has left no evidence of it.

Spaatz' orders were effective immediately, Eaker's upon the relief of Tedder. The orders were promptly amended to postpone Eaker's departure from ETO until he had given the benefit of his counsel to Spaatz and Doolittle in England. Consequently, he and his deputy, Air Marshal Sir John C. Slessor, did not reach the Mediterranean until mid-January.<sup>58</sup>

Tedder and Spaatz had left the final organization of MAAF for determination by the new commander,\* but substantial adjustments in the organization of AAF elements had been accomplished under a NATOUSA directive of 22 December. Effective 1 January 1944, USAAF/NATO became Army Air Forces, Mediterranean Theater of Operations (AAF/MTO). XII Air Force Service Command,<sup>†</sup> which since the establishment of the Fifteenth Air Force had served as a *de facto* theater service command for American organizations, became the Army Air Forces Service Command, Mediterranean Theater of Operations (AAFSC/MTO). The I Air Service Area Command remained under AAFSC/MTO, but II and III Air Service Area Commands were converted, respectively, into the XV Air Force Service Command and the XII Air Force Service Command. XII Air Force Engineer Command (Prov.) moved up, still in a provisional status, to become AAFEC/MTO. The Twelfth's training command retained its old numerical designation but was now XII Air Force Training and Replacement Command.<sup>59</sup>

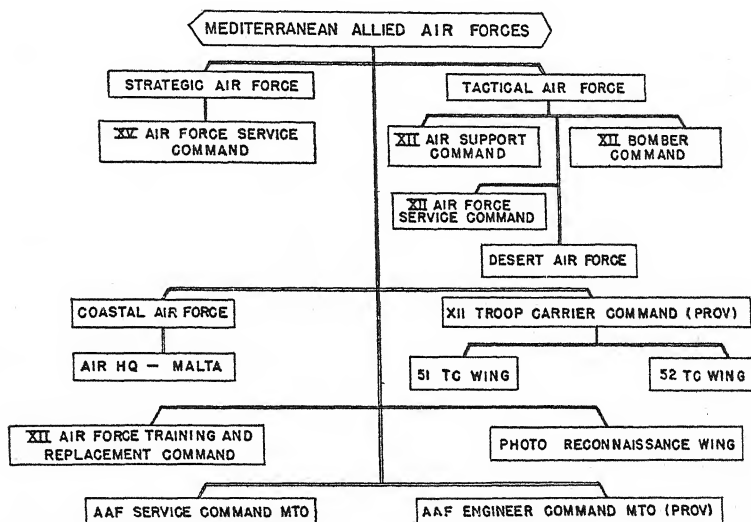
As commanding general, AAF/MTO, Eaker would have directly

\* On 27 December, MAAF issued an organization memorandum with the following instructions "pending full activation" of that headquarters: Headquarters, MAC, Algiers would relinquish its title and assume the title of Headquarters, MAAF (Rear), with responsibility for war organization (until MAAF [Advance] assumed the function) and for planning, maintenance and supply, and AFHQ liaison. Headquarters, NAAF, and Air Command Post (an advance headquarters at La Marsa, near Tunis) were combined under the new title of Headquarters, MAAF (Advance). The element would be responsible for all air staff duties other than those specifically assigned to MAAF (Rear) and for RAF administration in Northwest African, Central Mediterranean, and Malta Air Forces. The administration of RAF units in the Middle East would continue under Headquarters, RAFME, until the MAAF staff had been filled.

† The North African Air Service Command, of which XII AFSC had been the American element, now ceased to exist.

## FINAL REORGANIZATION

under him for administration of American units five major headquarters: Twelfth Air Force, Fifteenth Air Force, AAFSC/MTO, AAFEC/MTO, and the 90th Photo Reconnaissance Wing. As air commander in chief, Mediterranean, he would direct the operations of MAAF through subordinate combined headquarters which were changed now only in name. The well-established Strategic, Tactical, and Coastal Air Forces became MASAF, MATAF, and MACAF,\* and



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photo reconnaissance headquarters became the Mediterranean Allied Photo Reconnaissance Wing. Except for changes in units subordinate to the larger headquarters, the organization fixed upon in January 1944 would continue to the end of the war.

### *United States Strategic Air Forces*

Several of the changes effected by NATOUSA's directive of 22 December 1943, notably the creation of a theater air service command in the Mediterranean, were suggestive of General Knerr's proposed reorganization in ETO. It would seem, however, that General Spaatz

\*Twining, who had commanded the Thirteenth Air Force in the Pacific and took command of the Fifteenth Air Force in January 1944, served also in command of the MASAF. Similarly, Cannon, who was moved up to command of the Twelfth Air Force, commanded MATAF. AVM Hugh P. Lloyd continued in charge of MACAF.



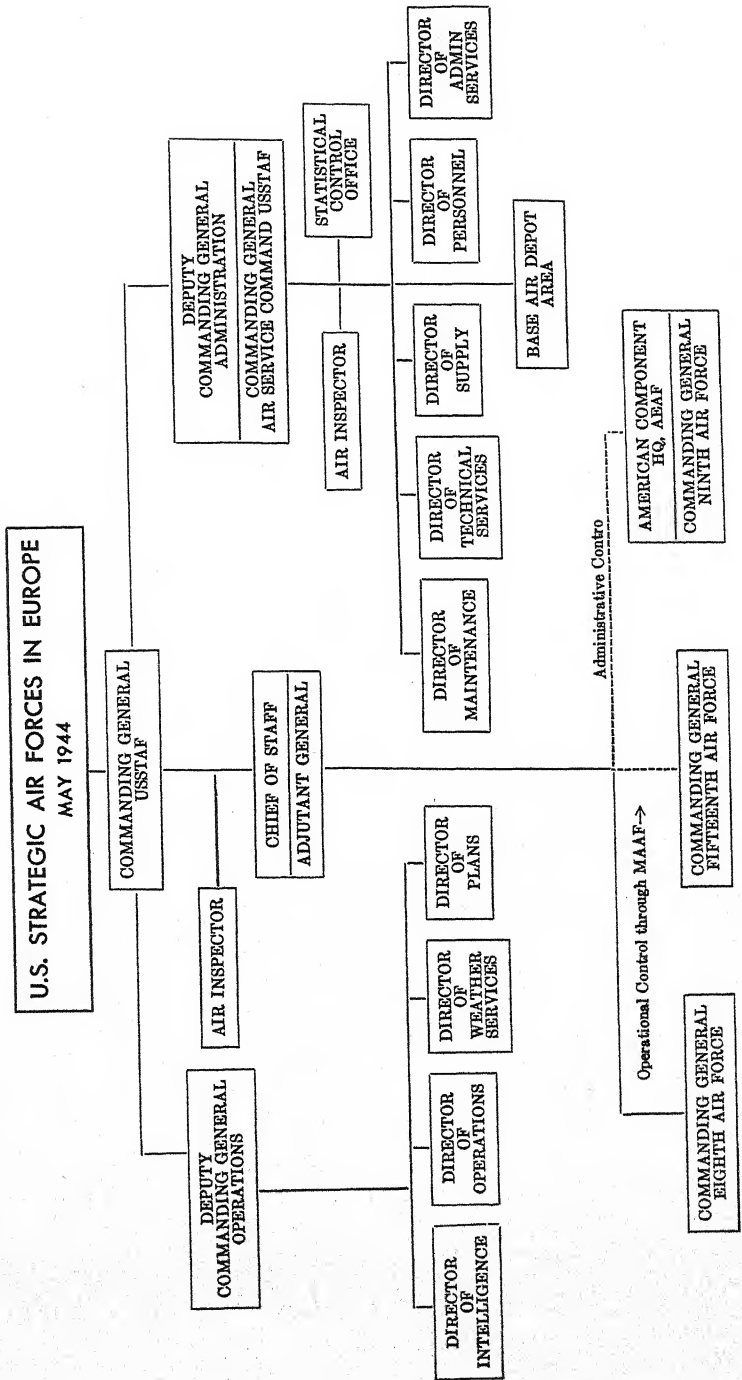
## THE ARMY AIR FORCES IN WORLD WAR II

was thinking, in advance of his arrival in England, along somewhat different lines. Discussions with members of his staff, on 24 December, of the administrative and operational responsibilities of his new command revealed a primary and natural concern for the effective coordination of bombing operations. He had apparently decided to set up a normal "A" staff organization with a few additional staff sections, and it was clear that he contemplated a small headquarters whose chief function would be to issue "broad orders and directives" to the Eighth and Fifteenth Air Forces, after coordination with the Air Ministry. The new headquarters would engage in strategic planning and the selection of targets, the setting of policies with regard to combat crew tours of duty, and the movement of personnel and equipment between the two headquarters. In other words, it would be a small operational headquarters with supervisory and policy-making functions.<sup>60</sup>

Such a plan of course overlooked considerations apparently more readily grasped in England than in the Mediterranean—among them the need for administrative controls to prevent unnecessary competition between the Eighth and Ninth Air Forces and the advantage with reference to AEAFA in the prompt establishment of a strong American headquarters for the administrative control of the Ninth.\* The unusual combination of responsibilities anticipated for the new command—administrative control of both strategic and tactical air forces in the United Kingdom and operational direction of both the Eighth and Fifteenth Air Forces—argued for the adoption of a two-deputy plan. Accordingly, when on 30 and 31 December, immediately after his arrival in England, Spaatz met with Eaker, Knerr, Chauncey, and Doolittle to discuss the organization of the new headquarters, it was decided that Spaatz would have a deputy for administration with jurisdiction over the Eighth and Ninth Air Forces and a deputy for operations to direct the strategic operations of the Eighth and Fifteenth Air Forces. Agreement was also reached on the establishment of a theater air service command. Eighth Air Force headquarters would become the new strategic air command headquarters, and VIII Bomber Command headquarters would become the new Eighth Air Force headquarters.

\* Actually, before he left North Africa on 29 December, Spaatz had come around to the belief that he would have to set up a larger headquarters in order to administer both the Eighth and the Ninth.

† In fact, VIII Bomber Command in the following reorganization ceased to exist, the Eighth Air Force thereafter dealing directly with the bombardment divisions. VIII Fighter Command continued.



## THE ARMY AIR FORCES IN WORLD WAR II

The new organization, its details having been perfected, was approved by Maj. Gen. Walter B. Smith, representing Eisenhower in England, on 1 January and by AAF Headquarters on 4 January.<sup>62</sup> On the next day Spaatz received from the Joint Chiefs of Staff authority to establish the U.S. Strategic Air Forces in Europe (USSTAF)\* as of 1 January 1944. On 6 January, General Order No. 1 appointed Maj. Gen. Frederick L. Anderson, theretofore commanding general of VIII Bomber Command, and Brig. Gen. Hugh J. Knerr as deputy commanders for operations and administration, respectively. Two days later the Headquarters and Headquarters Squadron, Eighth Air Force took leave of Bushy Park (WIDEWING) for High Wycombe, where General Doolittle was forming a new Eighth Air Force headquarters with the staff of the disbanded VIII Bomber Command as a nucleus. Most of the former staff officers of the Eighth remained at WIDEWING to serve in the new USSTAF headquarters.<sup>63</sup> On 18 January, General Eisenhower as theater commander gave the final legal sanction by delegating to USSTAF administrative responsibility for all U.S. Army air forces in the United Kingdom, a responsibility formally assumed by Spaatz on 20 January.<sup>64</sup>

On the operational side, the command structure now existing was simple enough. The Ninth Air Force remained under the operational control of the Allied Expeditionary Air Force. As for the strategic operations of the Eighth and Fifteenth Air Forces, General Anderson acted in behalf of Spaatz for their coordination.

On the administrative side, the story is more complex. General Knerr at one and the same time served as deputy commanding general for administration, USSTAF, and as commanding general, Air Service Command, USSTAF. The VIII Air Force Service Command headquarters became the Air Service Command, USSTAF headquarters, with the Base Air Depot Area as its chief component. The Strategic Air Depot Area became the new VIII Air Force Service Command, with headquarters at Milton Ernest. Like the IX Air Force Service Command, it operated under the technical control of the Air Service Command, USSTAF, which provided base services for both commands.<sup>65</sup> Of assistance in putting the new plan into effect was the fact that VIII Air Force Service Command headquarters, like that of the Eighth Air Force, had been located at Bushy Park. The changeover there was con-

\* The official abbreviation of the new headquarters was USSAFE until it was changed to USSTAF on 4 February 1944.

sequently for the most part a matter of drafting the necessary papers. The commanding general of USSTAF, the deputy for operations, and the whole of the latter's staff were assigned to the Headquarters and Headquarters Squadron, USSTAF. The deputy for administration, with staff, drew an assignment to the Headquarters and Headquarters Squadron, Air Service Command, USSTAF.<sup>66</sup>

General Knerr functioned in a dual capacity. As deputy for Spaatz he exercised a theater-wide authority over logistical questions; as commanding general of the air service command he directed the operation of its components in his own right. Actually, so much of the supervision of air service operations had been delegated to the Base Air Depot Area that Knerr was able to emphasize the advisory and policy-making functions of the deputy commanding general. There was of course a certain amount of confusion: if the general himself was never bothered by the question of which hat he wore, the same cannot be said of his staff. Subordinate headquarters also found cause for bother in this unorthodox organization.<sup>67</sup> But such minor difficulties were easily overshadowed by the recognition won for logistics as the legitimate partner of operations.

General Spaatz retained a chief of staff, but the office had been shorn of most of its normal duties. Only the adjutant general and the air inspector were responsible to the chief of staff, who headed in effect a secretariat for the commanding general.<sup>68</sup> In accordance with Knerr's recommendations, the major staff sections were designated directorates. Under the deputy commanding general for operations initially only two directorates existed—those for operations and for intelligence. Eventually, weather and plans sections would be added.<sup>69</sup> USSTAF, ADMIN, with separate directorates for personnel, supply, maintenance, and administration, constituted the greater part of the headquarters.\* The director of personnel combined the usual functions of A-1 with certain responsibilities for organization and movement taken over from the directorate of operations. Under the director of administration were united several former special staff sections—such as quartermaster, chemical, signal, ordnance, engineer, and medical. Knerr retained directly under him the statistical control office for assistance with organizational planning and control of reporting.<sup>70</sup>

The reorganization of January 1944 integrated operations and logis-

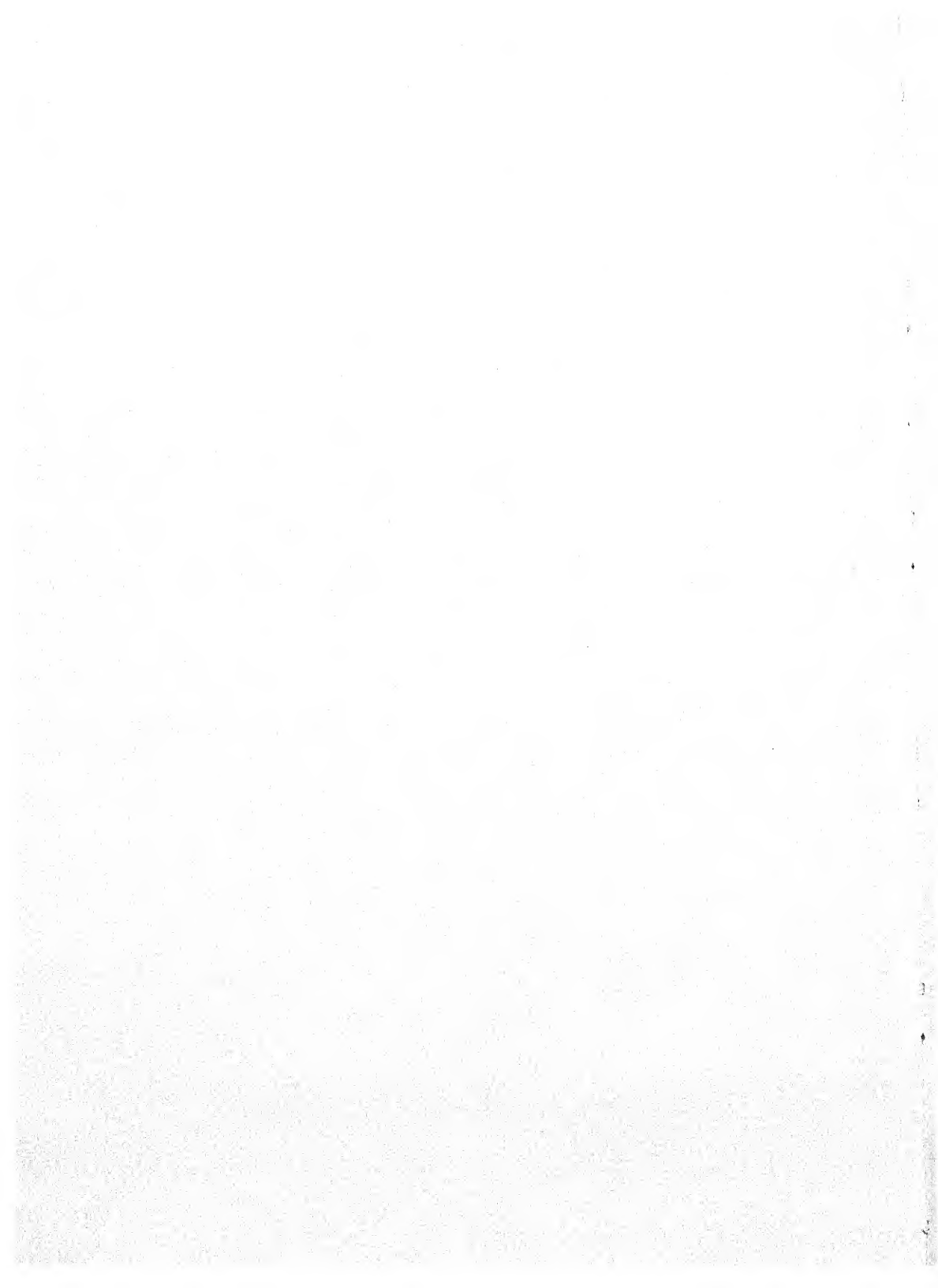
\* A directorate of technical services was added in February.

## THE ARMY AIR FORCES IN WORLD WAR II

tics in one headquarters to a degree never before attained and represented a triumph for the concept that logistics was of equal importance with operations. Few if any airmen would maintain that the ideal organization had been achieved in USSTAF, whether the view be that of its internal structure or its relative position in the over-all command of U.S. forces, but it came nearer the theater air force repeatedly advocated by Arnold and Spaatz than any headquarters yet established. And as with MAAF, it would serve until the victory had been won.

## NOTES





## NOTES

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11. CCS 39/1, 14 Mar. 1942.

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25. CM-OUT-3989 and 3990 (6-17-42), Arnold to AMSEG, Cairo, 1053 and 1054, 17 June 1942; CM-OUT-4135 (6-17-42), AGWAR to Cairo, 1063, 17 June 1942; File 77 (ltrs.).

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## NOTES TO CHAPTER 2

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6. Memo for Gen. Arnold from AFAEP, 1 Jan. 1942; Robert E. Sherwood, *Roosevelt and Hopkins* (New York, 1948), p. 460.

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12. CPS 2/3, 21 Feb. 1942.

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14. CPS 26/2/D, 28 Apr. 1942.

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33. Cf. n. 31.

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3. History, 14th Fighter Gp.; ltr., Doolittle to Stratemeyer, 31 Jan. 1943; interview with Lt. Norman Segal, 5 Mar. 1943.

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39. XII ASC report.

40. AIR 85, 3 Feb. 1943; msg., Doolittle to CO MCW, 1567, 20 Jan. 1943; msg., Doolittle to CG's XII ASC and XII BC, 0319, 5 Feb. 1943; msg., Doolittle to CG 1st ADW, 0420, 7 Feb. 1943; XII ASC report; msg., FAIRFIELD to Allied AF, unnumbered, 1 Feb. 1943; extracts from report of inspection trip by Col. J. H. McCormick (McCormick Rpt.).

41. Eisenhower's Dispatch, p. 34; II Corps Rpt.

42. McInnis, *The War: Fourth Year* (London, 1944), pp. 146-47; msg., Spaatz to Doolittle and Kuter, 8456, 1 Feb. 1943; msg., AASC, Beaver to 12th AF, A76, 3 Feb. 1943; msg., Adv. CP, AASC to XII ASC, K5, 3 Feb. 1943; AIR 76, 25 Jan. 1943.

43. AIR 83, 85, 86, 87, on 1, 3, 4, 5 Feb. 1943.

44. AIR 91, 9 Feb. 1943.

45. II Corps Rpt.

46. Msg., AASC, Beaver to Allied AF, A136, 7 Feb. 1943; msg., AASC, Beaver to AFHQ, A147, 8 Feb. 1943.

47. Commander in Chief's Dispatch, Sicilian Operation.

48. Eisenhower's Dispatch as cited in n. 17, pp. 28-29.

49. *Ibid.*

50. A German account admitted these losses for the night of 1/2 December: the Italian tanker Georgio [Giorgio] by Malta-based aircraft; by an enemy naval force, "several" cargo vessels and an Italian destroyer out of a convoy of four cargo vessels and five destroyers. According to

the Germans, the Allied naval force was minelaying and came upon the convoy by chance. (Cf. German Air Historical Br., The Battle for Tunis, November 1942-May 1943, dtd. 17 July 1944, BAM [AHB] Trans. VII/25, 19 May 1947.)

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53. Minutes of staff meeting, Hq. 12th AF, 11 Jan. 1943; msg., Doolittle to CG XII BC, 0714, 9 Jan. 1943; 12th AF Air Intel. Rpts. for the period; Engler interview; memo from office of NCXF, Algiers, Review of Situation Regarding Enemy Supplies to Tunisia, 10 Feb. 1943; Masthead Attacks against Shipping, p. 23; msg., Spaatz to Arnold, 7859, 30 Jan. 1943.

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57. Engler interview; CCS 159/1, 20 Jan. 1943.

58. AIR 64, 13 Jan. 1943; AC/AS, Intel., Impact, May 1943, pp. 26-27.

59. Impact, Apr. 1943, pp. 4-5; msg., Hq. RAFME to AFHQ, A406, 17 Jan. 1943; AIR 61, 64, 70, on 10, 13, 19 Jan. 1943; ltr., Spaatz to Arnold, 8 Feb. 1943; IAM, Air Operations by the 5th Squadra Aerea between October 20, 1942 and January 31, 1943, BAM (AHB) Trans. VII/66, 24 Mar. 1948, p. 24.

60. AIR 74 and 90, 23 Jan. and 8 Feb. 1943; Impact, Apr. 1943, p. 6.

61. Histories, 97th and 301st Bomb. Gps. and 1st and 14th Fighter Gps.

62. AIR 73-76, 22-25 Jan. 1943; msg., Doolittle to CG XII BC, 0612, 8 Jan. 1943.

63. Msg., Cannon to CG 12th AF, 3928, 31 Jan. 1943; msg., Doolittle to CG XII BC, 0086, 2 Feb. 1943; ltr., Spaatz to Arnold, 8 Feb. 1943; AIR 90, 8 Feb. 1943.

64. AIR 91, 98, 100-102, on 9, 15, 18-20 Feb. 1943.

65. RAFME Review No. 2, p. 32; II Corps Rpt.; Eisenhower's Dispatch, pp. 32, 34-35; AIR 97 and 99, 15 and 17 Feb. 1943; msg., AASC, First Army Hq. to XII BC, A177, 13 Feb. 1943, and 184, 14 Feb. 1943; msg., AASC to 12th AF, A190, 14 Feb. 1943; histories, 81st and 52d Fighter Gps. and 12th Bomb. Gp.; German doc., Course of War in MTO, as cited in n. 26.

66. History, Original XII AFSC; XII ASC report; msg., Hq. Allied AF to CG AASC, 598, 10 Feb. 1943; msg., AASC, First Army Hq. to Allied AF, A200, 14 Feb. 1943; msg., AASC, 18 Army Gp. to 12th AF, A122, 18 Feb. 1943; ltr., Spaatz to Arnold, 19 Feb. 1943.

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72. Ltr., Spaatz to Arnold, 8 Feb. 1943; msg., Hq. Allied AF to CG 8th AF, 0091, 2 Feb. 1943; msg., Hq. RAFME to Freedom, Algiers, A0262, 28 Jan. 1943.

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2. Eisenhower's Dispatch, p. 41; RAF Middle East Review No. 2, pp. 34-35.

3. NATAF, Tunisian Campaign, 18 Feb.-12 May 1943, pp. 12-18.

4. Hq. NAAF GO 1, 18 Feb. 1943.

5. Administrative History, 12th AF.

6. Hq. NAAF GO 18, 14 Mar. 1943, and annex 5 to GO 1, 18 Feb. 1943.

7. Hq. NAAF GO 23, 19 Mar. 1943.

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9. Forrest Davis, "How to Conquer the Continent," I, in *Saturday Evening Post*, 24 July 1943, p. 93; NATAF, Tunisian Campaign, p. 5.

10. NATAF, Tunisian Campaign, App. C.

11. *Ibid.*, pp. 2, 3, 5; msg., NATAF to NAAF, A22, 25 Feb. 1943.

12. Msg., NATAF to No. 326 Wing, 0-16, 6 Mar. 1943; ltr., Hq. No. 326 Wing to Hq. NATAF, 17 Mar. 1943; Hq. NATAF, Formation of Tactical Bomber Force under N.A.T.A.F., 3 Mar. 1943; Operational and Administrative Memo 1, Tactical Bomber Force, 24 Mar. 1943; Hq. NAAF GO 26, 20 Mar. 1943; History, 47th Bomb. Gp.

13. Ltr., Hq. TAF to XII ASC, n.d.; NATAF, Tunisian Campaign, pp. 6-7.

14. NATAF, Tunisian Campaign, p. 8 and App. B; msg., NATAF to XII ASC, A273, 3 Apr. 1943.

15. NATAF, Tunisian Campaign, p. 7; XII ASC rpt.; Report on Operations of the Western Desert Air Force from the Capture of Tripoli on 23rd January 1943 until the Final Surrender of the Axis Forces in North Africa on 13th May 1943 (hereinafter cited WDAF Operations, 23 Jan.-13 May 1943), p. 5.

16. AAF Engineer Comd., MTO, History of the Aviation Engineers in MTO, 12 June 1946.

17. Bernard L. Montgomery, *El Alamein to the River Sangro* (1946) (hereinafter cited as *Eighth Army*), pp. 51-53; CM-IN-12717, 456, 3608 (27 Jan., 2 and 7 Feb. 1943), Cairo to AGWAR, AMSME 4266, 4378, and 4511, 27 Jan., 1 and 7 Feb. 1943; WDAF Operations, 23 Jan.-13 May 1943, p. 1.

18. Administrative History, 9th AF; NATAF, Tunisian Campaign, p. 3; Hq. 9th AF GO 15, 24 Feb. 1943.

19. Hq. WDAF, Statement of Air Situation, Western Desert, on 27th February 1943; History, 57th Fighter Gp.; CM-IN-810 (3-2-43), Cairo to AGWAR, AMSME 4903, 2 Mar. 1943; Francis de Guingand, *Operation Victory* (London, 1947), p. 242; WDAF Operations, 23 Jan.-13 May 1943, pp. 3 and 8.

20. Histories, 324th and 79th Fighter Gps. and 12th Bomb. Gp.

21. Here, Montgomery's published account in *Eighth Army* (pp. 2, 53-57) is

followed, although according to Alexander's Despatch, p. 872, neither Montgomery nor Alexander displayed much anxiety at the time.

22. RAFME Review No. 2, pp. 16-17; Statement of Air Situation, Western Desert, on 27 February 1943.

23. Msg., 18th Army Gp. to Troopers, unnumbered, 21 Feb. 1943.

24. 18th Army Gp. Operation Instr. 4, 1 Mar. 1943; draft history, 12th AF, 20 Aug. 1942-31 Aug. 1945, chap. x.

25. Draft history, 12th AF, chap. x.

26. NATAF, Tunisian Campaign, p. 20.

27. NATAF, Outline Operational Plan, 8 Mar. 1943; ltr., Col. P. L. Williams to OIC, NATAF, 23 Mar. 1943; msg., NATAF to XII ASC, A188 (17 Mar.), A226 (24 Mar.), A246 (30 Mar. 1943).

28. Draft history, 12th AF, chap. x.

29. Msgs., NATAF to NAAF, A186, 17 Mar. 1943, and Spaatz to Coningham, 1642, 18 Mar. 1943.

30. Ltr., NATAF to CO XII ASC, 8 Mar. 1943.

31. Eisenhower's Dispatch, p. 42; draft history, 12th AF, chap. x.

32. Draft history, 12th AF, chap. x.

33. *Ibid.*; XII ASC rpt.

34. Draft history, 12th AF, chap. x.

35. *Ibid.*

36. *Ibid.*

37. Msg., NATAF to Adv. Air Hq., Western Desert, A245, 29 Mar. 1943; draft history, 12th AF, chap. x.

38. Draft history, 12th AF, chap. x; German Air Hist. Br., Development of the German Ground Attack Arm and Principles Governing its Operations up to the End of 1944, dtd. 1 Dec. 1944, Brit. Air Ministry, Hist. Br. (BAM[AHB]) Trans. VII/14, 20 Dec. 1946.

39. NATAF, Tunisian Campaign, p. 22.

40. Cf. CM-IN-5528 (2-11-43), Amembassy, London to Milid, 4239, 10 Feb. 1943, for Gen. Georges Catroux's description of the Mareth system, given to the War Office. Catroux, who had successfully sent M/T through the corridor from Dehibat, implies that the French had built a switch line before the war. This is definitely stated in USAFIME Periodic Intelligence Summary 17, 23-30 Jan. 1943. On the other hand, Montgomery, in *Eighth Army*, asserts that the switch line was constructed by Italian labor under German instruction

after the 1940 armistice. The contradiction may be more apparent than real: the Axis may have expanded earlier fortifications.

41. RAFME Review No. 2, p. 17; CM-IN-5765 (3-11-43), Cairo to AGWAR, AMSME 5060, 11 Mar. 1943; *Eighth Army*, pp. 57-59.

42. *Eighth Army*, pp. 60-61; RAFME Review No. 2, pp. 15-18.

43. RAFME Review No. 2, pp. 18, 41-45; histories, 57th, 324th, 12th, and 79th Gps.; CM-IN-4333 (4-8-43), Cairo to AGWAR, AMSME AF440, 7 Apr. 1943.

44. *Eighth Army*, pp. 60-64; NATAF, Tunisian Campaign, p. 23; RAFME Review No. 2, pp. 40-42.

45. WDAF Operations, 23 Jan.-13 May 1943, p. 12; *Operation Victory*, pp. 256-64; msg., AHQ WD to Hq. RAFME, unnumbered, 6 Apr. 1943.

46. *Operation Victory*, pp. 256-64; MIS WD, Military Reports on the United Nations No. 7, 15 June 1943; *Eighth Army*, pp. 66-68; RAFME Review No. 2, pp. 45-47, No. 3, p. 137.

47. *Operation Victory*, p. 264.

48. File 77 (msgs.); msg., NATAF to AHQ WD, A314, 12 Apr. 1943.

49. *Eighth Army*, pp. 69-72; RAFME Review No. 3 (Apr.-June 1943), pp. 6. 10.

50. Draft history, 12th AF, chap. x.

51. *Ibid.*; Eisenhower's Dispatch, p. 44; XII ASC rpt.; NATAF, Tunisian Campaign, p. 26; histories, 33d and 52d Fighter Gps.

52. Draft history, 12th AF, chap. x; RAFME Review No. 3, p. 12; Davis, "How to Conquer the Continent," I, in *Saturday Evening Post*, 24 July 1943, p. 94; History, 47th Bomb Gp.

53. Administrative History, 9th AF; ltr., Andrews to Arnold, 22 Nov. 1942; ltr., Col. C. H. Barth, AC/S G-4, USAFIME to Col. D. V. Johnson, OPD, 26 Jan. 1943; History, IX BC.

54. History, IX BC; History, 98th Gp.

55. RAFME Review No. 2, pp. 18-20; History, 376th Gp.; CM-IN-13859 (2-27-43), Cairo to AGWAR, AMSME AF63, 26 Feb. 1943; CM-IN-13335 (2-26-43), Cairo to AGWAR, AMSME AF61, 25 Feb. 1943.

56. History, 93d Gp. (attack of 20 Feb.); CM-IN-11843 (2-23-43), Cairo to AGWAR, AMSME AF40, 22 Feb. 1943.

57. Administrative History, 9th AF;

histories, 812th and 835th Engineer Avn. Bns.; History, IX BC.

58. History, IX BC; CM-IN-4333 (4-8-43), Cairo to AGWAR, AMSME AF440, 7 Apr. 1943.

59. History, IX BC; RAFME Review No. 3, p. 26.

60. RAFME Review No. 3, p. 28; History, 376th Gp.; History, IX BC.

61. History, IX BC; RAFME Review No. 3, p. 28; Hq. NATAF, TAF Operational Plan for Final Assault on Tunisia, 16 Apr. 1943; MEIU Photo Interpretation Rpts. 2823 and 2829, 8 and 11 May 1943; BAM (AHB) trans. of Italian doc., Italian Merchant Shipping Sunk in the Med., 10 June 1940-8 Sept. 1943.

62. U.S. naval attaché, Cairo, Notes on Axis Shipping Situation, 7 Feb. 1943; memo from office of NCXF, Algiers, Review of Situation Regarding Enemy Supplies to Tunisia, 10 Feb. 1943; Extract from Report of Fuehrer Conference, 1 Feb. 1943, BAM (AHB) Trans. VII/44, 25 Sept. 1947; draft history, 12th AF, chap. x.

63. German Air Hist. Br., The Battle for Tunis, Nov. 1942-May 1943, dtd. 17 July 1944, and A Tactical Appreciation of the Air War in Tunisia, 31 Oct. 1944, BAM (AHB) Trans. VII/25, 19 May 1947, and VII/6, 21 Oct. 1946.

64. Draft history, 12th AF, chap. x; Hq. NAAF Opns. Order 3, 24 Mar. 1943.

65. Hq. NAAF GO 1, 18 Feb. 1943, Annex 3; History, 2d Air Defense Wing, 12 Dec. 1942-30 Sept. 1943; Col. S. W. Towle, Report on Fighters and ADW's, 10 Apr. 1943.

66. Draft history, 12th AF, chap. x.

67. *Ibid.*

68. *Ibid.*; Hq. NAAF Opns. Order 3, 24 Mar. 1943.

69. RAFME Review No. 2, p. 38, No. 3, p. 23; draft history, 12th AF, chap. x.

70. Draft history, 12th AF, chap. x.; interview with Lt. Col. H. E. Engler, 27 May 1943; RAFME Review No. 2, p. 48; Italian Merchant Shipping Losses, as cited in n. 61.

71. Italian Merchant Shipping Losses; draft history, 12th AF, chap. x.

72. Draft history, 12th AF, chap. x; René Dupuy, Chronological Report of Events Observed from 10 Nov. 1942 to 11 May 1943, dtd. 21 June 1943; Hq. European Comd., office of the chief historian,

Generalleutnant Ulrich Buchholz, Supply by Air of the Enlarged Bridgehead of Tunis, from 1 Dec. 1942 to 11 May 1943, dtd. 9 May 1947. German sources indicate that about 37,000 men and 9,000 metric tons of materiel were brought into Africa by the GAF air transport service during November and December 1942, the vast majority to Tunisia. For January 1943 the approximate figures are 15,000 personnel, 5,000 metric tons of materiel; for February, 11,000 personnel, 4,000 metric tons of materiel. The figures for April-May diminish to 8,000 personnel, 5,000 metric tons of materiel. (Cf. German Air Hist. Br., The Luftwaffe in the Battle for Tunis: A Strategical Survey, 17 Oct. 1944, BAM (AHB) Trans. VII/5; German doc., O. Qu. [Deputy chief of General Staff] Tunis, Qu. [Supply] 3, Operations Report, Nov.-Dec. 1942.)

73. Buchholz Rpt., as in n. 72; draft history, 12th AF, chap. x; Hq. European Comd., office of the chief historian, Maj. Gen. Conrad Seibt, Railroad, Sea, and Air Transport Situation for Supply of Africa through Italy, Jan.-May 1943, dtd. 15 Mar. 1947.

74. Msgs., Hq. EAC to 242 Gp., A426, 5 Feb. 1943; AASC to Hq. Allied AF, A130, 6 Feb. 1943; AASC to 242 Gp., A142, A515, and A257, 6, 11, and 19 Feb. 1943; Cannon to Spaatz, unnumbered, 9 Feb. 1943; Notes on Conference held at Hq. 242 Gp., 13 Feb. 1943; Hq. 242 Gp., Opns. Order 1, 15 Feb. 1943.

75. Draft history, 12th AF, chap. x; ltr., Spaatz to Eaker, 9 Apr. 1943; Hq. NAAF, Opns. Bulletin 1, 30 Apr. 1943.

76. Hq. NAAF, Opns. Bulletin 1, 30 Apr. 1943; draft history, 12th AF, chap. x; German Air Hist. Br., The Course of the War in the MTO, Jan. 1-May 3, 1943, dtd. 29 July 1944.

77. The Battle for Tunis, and A Tactical Appreciation, as cited in n. 63.

78. Hq. NAAF, Opns. Bulletin 1, 30 Apr. 1943.

79. History, 57th Gp.; NATAF, Tunisian Campaign, pp. 30-31.

80. NATAF, Tunisian Campaign, pp. 30-31; Dupuy Rpt., as in n. 72; histories, 57th and 324th Fighter Gps.; The Battle for Tunis; RAFME Review No. 3, pp. 17-18.

81. RAFME Review No. 3, pp. 18, 30;

Buchholz Rpt., NATAF, Tunisian Campaign, pp. 30-31; msg., NAAF to AHQ WD, A146, 25 Apr. 1943.

82. RAFME Review No. 3, pp. 28-29.

83. Ltr., Spaatz to Stratemeyer, 26 Mar. 1943; Lt. Col. Caldwell [to CG 3d Bomb. Wing], Report on Medium Bombers, 12 Mar. 1943, cited in Hq. 3d Bomb. Wing General Staff Mtg. 28, 5 Apr. 1943.

84. Cf. ltr., Doolittle to CG AAF, 22 May 1943.

85. Draft history, 12th AF, chap. x.

86. *Ibid.*

87. Ltr., Spaatz to Eaker, 9 Apr. 1943.

88. Msgs., AGWAR to NATOUSA, R5785, 12 Feb. 1943; 12th AF to AGWAR, 0759, 12 Feb. 1943; AGWAR to USFOR, R5786, 14 Feb. 1943; memo for CG ETO-USA from Eaker, 13 Feb. 1943; ltr., Stratemeyer to Eaker, 8 Mar. 1943; Administrative History, 9th AF.

89. Draft history, 12th AF, chap. x.

90. RAFME Review No. 3, p. 23.

91. *Ibid.*, pp. 23-24; NATAF, Tunisian Campaign, p. 29; History, 324th Gp.; Dupuy Rpt.

92. RAFME Review No. 3, p. 31.

93. Ltr., JICA EBS to JICA AFHQ, n.d.

94. Draft history, 12th AF, chap. x; interview with Maj. P. F. Hennin, 5 June 1943; RAFME Review No. 3, pp. 13-14, 23; NAAF Operational and Intel. Sums. 62 and 63; Italian Merchant Shipping Losses, 1940-43; Brit. Admiralty List of Allied Air Force Claims of Damage to Enemy Shipping in the Mediterranean, 1 June 1942-31 Dec. 1943, dtd. 4 June 1948.

95. Ltr., Spaatz to Arnold, 24 May 1943.

96. RAFME Review No. 3, pp. 26-27, 31, 37-38; draft history, 12th AF, chap. x; Hq. European Comd., Railroad . . . Supply of Africa through Italy, as in n. 73.

97. Historical Div., War Dept., *To Bizerte with the II Corps*, 23 April 1943-13 May 1943 (Washington, 1943), pp. 4-9; Eisenhower's Dispatch, p. 46.

98. RAFME Review No. 3, p. 13; Lt. Gen. K. A. N. Anderson's Despatch, 7 June 1943, p. 5459.

99. Field Marshal Alexander's Despatch, 23 May 1947, p. 878; *Eighth Army*, p. 73.

100. *Eighth Army*, pp. 75-76; RAFME Review No. 3, p. 18.

101. RAFME Review No. 3, p. 18.

102. Histories, 340th and 12th Bomb. Gps., 57th and 79th Fighter Gps.

103. Hq. First Army Instruction 37, 19 Apr. 1943; *To Bizerte with the II Corps*, pp. 11-12.

104. Kesselsring, in a dispatch of 3 March, had predicted that, once compressed in the Cap Serrat-Enfidaville position and driven from the airfields on the maritime plain, the Axis armies would be crushed by the weight of Allied air power which would cut off supply channels. (The Battle for Tunis.)

105. Draft history, 12th AF, chap. x; GSI/NATAF Appreciation No. 1, Axis Evacuation of Tunisia, 4 Apr. 1943; Hq. NAAF Opns. Order 4, 3 Apr. 1943; Hq. NATAF, Operational Directive for Period of Enemy Evacuation from Tunisia, 12 Apr. 1943.

106. NATAF, Tunisian Campaign, p. 29; RAFME Review No. 3, p. 41.

107. *Biennial Report*, Chief of Staff to Sec. of War, 1 July 1943 to 30 June 1945.

108. NATAF, Tunisian Campaign, pp. 28-48; XII ASC, Report of Tunisian Operations, 10 Apr.-13 May 1943, p. 2.

109. Draft history, 12th AF, chap. x; K. B. B. Cross, Report on Air Operations by 242 Group, p. 2; ltr., Hq. NATAF to XII ASC, 12 Apr. 1943.

110. Hq. NATAF, TAF Operational Plan for Final Assault on Tunis, 16 Apr. 1943.

111. Report on Air Operations by 242 Group, pp. 7-8; draft history, 12th AF, chap. x; NATAF, Tunisian Campaign, pp. 28-29; Davis, "How to Conquer the Continent," I, in *Saturday Evening Post*, 24 July 1943, p. 94; German Air Hist. Br., Development of the German Ground Attack Arm and Principles Governing its Operations up to the End of 1944, dtd. 1 Dec. 1944, BAM (AHB) Trans. VII/14, 20 Dec. 1946.

112. Anderson's Despatch, p. 5460; Alexander's Despatch, pp. 880-81.

113. Eisenhower's Dispatch; *To Bizerte with the II Corps*, pp. 9-36.

114. NATAF, Tunisian Campaign, p. 31; RAFME Review No. 3, pp. 21-22.

115. *Eighth Army*, p. 76; Eisenhower's Despatch, p. 46.

116. Anderson's Despatch, p. 5461; Alexander's Despatch, pp. 881-82; Report on Air Operations by 242 Group, App. A, 242 Group Outline Plan; draft history, 12th AF, chap. x; msg., TAF Hq. to Adv.

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AHQ WD, A452, 5 May 1943; msg., NATAF to 205 Gp., A431, 1 May 1943.

117. Draft history, 12th AF, chap. x; History, 47th Bomb. Gp.; Eisenhower's Dispatch, p. 46; Report on Air Operations by 242 Group, p. 10; Davis, "How to Conquer the Continent," II, in *Saturday Evening Post*, 31 July 1943, p. 21.

118. Davis, "How to Conquer the Continent," II, 21, 93; draft history, 12th AF, chap. x; German Air Hist. Br., *The Battle for Tunis*.

119. Davis, "How to Conquer the Continent," II, 93-94; *To Bizerte with the II Corps*, pp. 37-50.

120. Alexander's Despatch, pp. 883-84.

121. Draft history, 12th AF, chap. x.

122. Davis, "How to Conquer the Continent," II, 93-94; RAFME Review No. 3, pp. 35-36.

18. OSS Rpt., 19 Oct. 1942.

19. This light bomb squadron was temporarily assigned to the 1st Bombardment Wing of VIII Bomber Command and later consigned to Africa.

20. First 1100, Mission 10.

21. Compare reconnaissance photos included in First 1100 for this mission and for No. 7.

22. *Ibid.*, Mission 11.

23. *Ibid.*, Mission 12. On 30 September 1942, Spaatz complained of the preceding three weeks of weather which, he said, was considered unusually bad in England. (Ltr., Spaatz to Stratemyer, quoted in R&R, AFCAS to Dir. of Air Defense, 5 Oct. 1942.) On 8 September General Spaatz ordered all tactical operations to give way to activity in support of TORCH. (Operation TORCH, Pt. I, p. 1.)

24. CM-IN-2353 (10-6-42), London to AGWAR, 3155, 5 Oct. 1942; First 1100, Mission 13. The figures in the latter source show some variations.

25. First 1100, Mission 13.

26. *New York Times*, 10 Oct. 1942, p. 13; First 1100, Mission 14.

27. First 1100, Mission 14. Cf. CM-IN-04049 (10-10-42), USAWW to AGWAR, 244E, 10 Oct. 1942, which gives 65.

28. First 1100, Mission 14. The figures in Intelligence Narrative 14 do not agree with those given in Interpretation Report S.A. 151. Neither source agrees with CM-IN-04049. Figures taken from ORS Day Raid Rpt. 13, 30 Dec. 1942.

29. See bomb plot in First 1100, Mission 14. Cf. ORS Day Raid Rpt. 13.

30. Ltr., Eaker to CG 8th AF, 1 Nov. 1942, in papers sent to AFSHO by Col. J. M. Parton.

31. OSS Rpt., 25 Nov. 1942.

32. OSS Rpt., 17 Oct. 1942.

33. First 1100, Mission 14, Interp. Rpts. K. 1413 and K.S. 63.

34. OSS Rpt., 25 Nov. 1942.

35. Draft memo for Harry Hopkins, filed with R&R, AFDAS to AFABI, 11 Oct. 1942. Cf. First 1100, Mission 14.

36. These figures taken from CM-IN-04049, cited in n. 27, and CM-IN-10602 (10-25-42), USAWW to AGWAR, 705E, 24 Oct. 1942. Cf. First 1100, Mission 14.

37. Cables cited in n. 36; R&R, AFAEP to AFDAS, 27 Aug. 1942, filed with R&R, AFDAS to AFABI, 11 Oct. 1942; incl. to

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1. AAF Reference History No. 2, Origins of the Eighth Air Force (hereinafter cited as AAFRH-2), p. 71.

2. A/P Status Rpts., BOLERO Papers.

3. AFSHO File "Directives, Joint Anglo-American Opns."

4. History, 8th AF, II, 197 ff.; R&R, C/AS to AC/AS, A-3, 3 Nov. 1942.

5. Diary, VIII BC, 1 Aug. 1942; memo for CG 8th AF from AC/AS, A-5, 14 Aug. 1942.

6. Ltr., Spaatz to CG VIII BC, 25 Aug. 1942.

7. AFSHO Special File 77 (ltrs.).

8. First 1100 Bombers Dispatched by Eighth Bomber Command (hereinafter cited as First 1100), Mission 2.

9. *Ibid.*, appropriate mission rpts.

10. *Ibid.*, Mission 4.

11. *Ibid.*

12. Ltr., Eaker to CG 8th AF, 27 Aug. 1942.

13. First 1100, appropriate mission rpts., including ORS Day Raid Rpts.

14. *Ibid.*, Mission 9, especially ORS Day Raid Rpt. 9, 30 Dec. 1942.

15. Bombs dropped were: 123 x 500 HE, 32 x 1,100 HE, 43 x 1,000 HE, and 16 x 250 incendiary. (*Ibid.*)

16. *Ibid.*, Interpretation Rpts. F 301 (11 Sept. 1942), F 303/K.S. 60 (4 Oct. 1942).

17. OSS Rpt., 15 Nov. 1942.

rpt. recd. by CG AAF from 8th AF, 3 Mar. 1943.

38. Draft memo for Hopkins cited in n. 35.

39. History, 1st Bomb. Div., p. 14; Air Intel. School, The Interrogation of Bomber Crews, 24 Aug. 1942; VIII BC, *Target: Germany* (New York, 1943), pp. 15-16.

40. VIII BC, Encounter Rpts.

41. Incl. to rpt., CG 8th AF to CG AAF, 3 Mar. 1943.

42. *Ibid.*

43. CM-OUT-3659 (1-11-43), CG AAF to CG 8th AF, A-1313, 9 Jan. 1943; CM-OUT-7903 (12-23-42), AFABI to CG 8th AF, A1153, 22 Dec. 1942; CM-IN-11208 (12-26-42), Algiers to USFOR-AGWAR, 3083, 25 Dec. 1942; ltr., Spaatz to ACM Sir Sholto Douglas, n.d. but shortly after 8 Nov. 1942.

44. Ltr., Eaker to Stratemeyer, 30 Jan. 1943.

45. Ltr., Eaker to CG 8th AF, 25 Aug. 1942.

46. Ltr., Spaatz to Arnold, 24 Aug. 1942.

47. First 1100, II, 401.

48. Ltr., Eaker to CG 8th AF, 27 Aug. 1942.

49. 1st ind. (to basic in n. 48), Hq. 8th AF to CG ETOUSA, 27 Aug. 1942; ltr., Spaatz to Arnold, 24 Aug. 1942.

50. R&R, AFDAS to AFABI, AFAEP, AFAAP, AFACT, AFADS in turn, 31 Aug. 1942. Cf. ltr., Spaatz to Stratemeyer, 14 Sept. 1942.

51. Paper sgd. by Maj. F. S. Wildman, Current Intel. Sec., A-2, European Theater, 26 Oct. 1942.

52. Ltr., Spaatz to Arnold, 24 Aug. 1942. Cf. Eaker Diary, 18 Aug. 1942.

53. Ltr., Eaker to CG AAF, 27 Aug. 1942.

54. Operations by Fortress Aircraft of the Eighth Air Force from 17 August to 6 September 1942, incl. to rpt., Capt. E. V. Rickenbacker to S/W, 12 Oct. 1942. Rickenbacker recommended that this letter be read by all USAAF personnel.

55. Quoted in CM-IN-0594 (9-2-42), USAWW to AGWAR, 5APO, 1 Sept. 1942.

56. *Sunday Times* (London), 23 Aug. 1942.

57. *Ibid.*, 6 Sept. 1942.

58. *Ibid.*, 18 Oct. 1942.

59. Ltr., Spaatz to Stratemeyer, 14 Sept. 1942.

60. Interview with Col. F. Armstrong, 24 Nov. 1942; History, 1st Bomb. Div.; CM-IN-1410 (10-4-42), USAWW to AGWAR, 81E, 3 Oct. 1942; CM-OUT-1644 (10-6-42), AFDMR to USAWW, A-393, 5 Oct. 1942.

61. Report of Lt. Gen. Ira C. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942, to Dec. 31, 1943 (hereinafter cited as Eaker Rpt.), Tab C, p. 2; Achtung Indianer, a history of VIII FC, pp. 104-6; History, VIII FC, Aug. 1942-Apr. 1945, pp. 116 ff.

62. CM-IN-0425 (10-1-42), London to AGWAR, 2951, 30 Sept. 1942; History, VIII FC, p. 103. Apparently former Eagle pilots also were assigned to the 35th Fighter Group. (CM-IN-2602 [10-7-42], London to AGWAR, 3181, 6 Oct. 1942; rpt. of VIII FC, 8 Aug. 1943.)

63. CM-IN-0442 (9-1-42), London to AGWAR, 1715, 1 Sept. 1943.

64. Ltr., Spaatz to Arnold, 16 Sept. 1942.

65. Interview with Lt. Col. C. S. Hough, 1 Apr. 1943. Cf. ltr., Spaatz to Arnold, 16 Sept. 1942.

66. Ltr., Spaatz to Stratemeyer, 14 Sept. 1942.

67. Ltr., Spaatz to Arnold, 16 Sept. 1942. They made their first operational flight 1 September 1942. (CM-IN-0389 [9-1-42], USAWW to AGWAR, 14E, 1 Sept. 1942.)

68. History, VIII FC, p. 106.

69. Operation TORCH, Pt. I, p. 1.

70. *Ibid.*, Pt. I, p. 20.

71. *Ibid.*, Pt. II, pp. 12-13.

72. History, VIII AFSC, chap. i, p. 23.

73. Ltr., OIG, Hq. 8th AF to CG 8th AF, 23 Nov. 1942; History, 1st Bomb. Div., p. 15.

74. Operation TORCH, Pt. I, pp. 3 ff. and Pt. II, p. 17.

75. Ltr., Spaatz to Stratemeyer, 30 Sept. 1942, quoted in R&R, AFCAS to Dir. of Air Defense, 5 Oct. 1942.

76. See n. 23 above.

77. Ltr., Eaker to Stratemeyer, 8 Oct. 1942.

78. History, 2d Bomb. Div. (and 2d Bomb. Wing), Activation to 31 Dec. 1943, p. 34; ltr., Eaker to CG 8th AF, 1 Nov. 1942.

79. USSBS, Military Analysis Div., The



Defeat of the GAF; 8th AF and AAF Evaluation Board, ETO, Eighth Air Force Tactical Development, Aug. 1942-May 1945, 9 July 1945.

80. Ltr., AC/S, A-2, 8th AF to Col. G. C. MacDonald, 24 Oct. 1942. This source estimated a slight over-all loss in strength for September 1942. (Cf. ltr., Arnold to Maj. Gen. G. C. Kenney, CG AAF in SWPA, 8 Oct. 1942.)

81. Ltr., AC/S, A-2, 8th AF to Col. G. C. MacDonald, 24 Oct. 1942.

82. Ltr., Spaatz to Arnold, 16 Sept. 1942. Cf. CM-IN-04557 (10-11-42), London to AGWAR, 3422, 10 Oct. 1942.

83. Ltr., Eaker to CG 8th AF, 1 Nov. 1942.

84. First 1100, Mission 15.

85. Ltr., Eaker to CG 8th AF, 1 Nov. 1942.

86. Operation TORCH, Pt. II, p. 2.

87. Ltr., Eaker to CG 8th AF, 1 Nov. 1942.

88. A/P Status Rpts., BOLERO Papers.

89. Ltr., Eaker to CG 8th AF, 1 Nov. 1942.

90. *Ibid.* Cf. rpt., Capt. E. V. Rickenbacker to S/W, 12 Oct. 1942; ltr., Spaatz to Arnold, 31 Oct. 1942.

91. Ltr., Eaker to Arnold, 20 Oct. 1942, quoted in AAF memo to all AF's, 7 Nov. 1942.

92. Ltr., Eaker to Stratemyer, 8 Oct. 1942.

93. Ltr., Hq. 8th AF to CG's VIII BC and VIII FC, 20 Oct. 1942, in Eaker Rpt.

94. Memo for Spaatz from Eisenhower, 13 Oct. 1942; File 706.

95. File 706.

96. OSS Rpt., 19 Oct. 1942. See also *ibid.*, 26 Dec. 1942.

97. *Ibid.*, 19 Oct., 15, 25 Nov., 26 Dec. 1942.

98. Translation of memo from Col. Coustet, 30 Oct. 1942. Cf. OSS Rpt., 26 Dec. 1942.

99. Eaker Rpt., Tab E, Exhibit 1.

100. Target Sec., Dir. of Intel., 8th AF, Target Priorities of the Eighth Air Force, a Résumé of the Bombardment Directives and Concepts Underlying Them, 15 May 1945; AFSHO File "Directives, Joint Anglo-American Opns."; ltr., Hq. 8th AF to CG's VIII BC and VIII FC, 21 Oct. 1942.

## NOTES TO CHAPTER 8

1. A-5, 8th AF, An Appreciation of the Air Effort against Submarines, 16 Jan. 1943, included as Tab G in Intel. Service, Hq. AAF, An Evaluation of the Air Effort against Submarines (hereinafter cited as Evaluation). See also *ibid.*, App. C.

2. *Ibid.*, Tab N, Bombing Attacks on the German U-boat Industry, 21 July 1942.

3. *Ibid.*, Tab G, App. C.

4. AC/AS, A-2, Hq. AAF, Air Estimate: The Submarine Situation in Europe (hereinafter cited as Air Estimate, Subs.), Pt. I, Opns. Sec., 12 Feb. 1942, p. 1. Cf. ltr., Stratemyer to Spaatz, 26 Nov. 1943; AAF Reference History No. 7, The Antisubmarine Command, chap. iii.

5. Air Estimate, Subs., Pt. I, pp. 4-7.

6. *Ibid.*, pp. 94-95. See also memo for CG AAF from Brig. Gen. C. W. Russell, 3 Nov. 1942.

7. 2d ind. (no basic), CG 8th AF to CG AAF, 15 Sept. 1942; ltr., Spaatz to Arnold, 31 Oct. 1942.

8. Air Estimate, Subs., Pt. I, pp. 4-7.

9. Evaluation, Tab N.

10. *Ibid.*, Tab G, App. C.

11. Ltr., Eaker to Spaatz, 14 Oct. 1942.

12. *Ibid.*

13. Memo for CG AAF from Russell, 3 Nov. 1942. Cf. Plans Div. Digest, 7 Nov., 21 Dec. 1942.

14. First 1100 Bombers Dispatched by Eighth Bomber Command (hereinafter cited as First 1100), II, 383; CG 8th AF, extract of Daily Diary, 2 Nov. 1942; ltr., Arnold to Eaker, 2 Dec. 1942. The B-24's referred to were to be replaced from allocations to the AAFAC.

15. First 1100, Mission 15.

16. *Ibid.*

17. OSS Rpt., 26 Dec. 1942; OSS Rpt. P.1/3780, 27 Jan. 1943; First 1100, Mission 15; Interp. Rpt. S.A. 154; ORS Day Raid Rpt. 14, 30 Dec. 1942.

18. OSS rpts. cited in n. 17. See also translation of memo from Col. Coustet, 30 Oct. 1942.

19. First 1100, Mission 15.

20. Ltr., Spaatz to Arnold, 31 Oct. 1942.

21. Ltr., Arnold to Spaatz, Oct. 1942; 2d ind. (no basic), CG 8th AF to CG AAF, 15 Sept. 1942.

22. Ltr., Spaatz to Arnold, 31 Oct. 1942.

23. First 1100, Mission 18.

24. *Ibid.*, II, 401 ff.
25. *Ibid.*, Mission 18.
26. ORS Day Raid Rpt. 17, 30 Dec. 1942; First 1100, Mission 18. See especially Interp. Rpt. K. 1433 and Statistical Analysis of Opns.
27. See Tac. Mission Folders, *passim*.
28. First 1100, Mission 21; reports on Missions 19 to 27, in Tac. Mission Folders.
29. First 1100, II, 369.
30. Industry Dmg. Rpt. 62, 9-22 Nov. 1942, 23 Dec. 1942; OSS Rpt., 11 Jan. 1943; N.I.D. U.C. Rpt. E964C, Attacks on U-boat Bases by U.S. Aircraft, 3 Dec. 1942. See also interp. rpts. in respective mission rpts., especially rpt. on info. recd. from German naval POW taken in Dec. 1942.
31. Intel. Staff, Air Ministry, Analysis of Results of USAAF Bombing Attacks on Submarine Bases in France during November 1942 (hereinafter cited as Analysis of Results); VIII BC Narrative of Opns. in Tac. Mission Folder 28.
32. ORS Day Raid Rpt. 28, in Tac. Mission Folder 28; Ind. Dmg. Rpt. 66, 23 Feb. 1943.
33. OSS Rpt. P.1/4330, 2 Mar. 1943.
34. AAF Info. Intel. Rpt. 43-4, 26 Mar. 1943; ORS Day Raid Rpt. 28; Evaluation, Tab G, App. A. Figures on USAAF losses represent losses from all causes, including crashes. (Cf. incl. to rpt., CG 8th AF to CG AAF, 3 Mar. 1943.)
35. ONI, The Conduct of the War at Sea (translation of essay by Adm. Karl Doenitz), 15 Jan. 1946, p. 19. Cf. AAFRH-7, chap iii; Naval Attaché Rpt., 12 Feb. 1943; ltr., Eaker to Arnold, 11 Jan. 1943.
36. First 1100, II, 367; N.I.D. U.C. Rpt. 272, 21 Nov. 1942.
37. AFSHO Special File 77 (ltrs.).
38. *Ibid.*; ltr., Naval Staff Officer, Hq. RAF Bomber Comd. to Eaker, 25 Nov. 1942, in First 1100, II, 380; N.I.D. U.C. Rpt. E964C, 3 Dec. 1942.
39. Analysis of Results; ltr., Hq. VIII BC to Eaker, 2 Jan. 1943; ltr., Eaker to Arnold, 11 Jan. 1943.
40. Ltr., Stratemyer to Spaatz, 26 Nov. 1942; ltr., Arnold to Eaker, 2 Dec. 1942.
41. Ltr., Stratemyer to Spaatz, 26 Nov. 1942.
42. Ltr., Eaker to Stratemyer, 2 Jan. 1943; ltr., Eaker to Arnold, 11 Jan. 1943.
43. Ltr., Eaker to Arnold, 26 Nov. 1942; ltr., Eaker to Arnold, 11 Jan. 1943.
44. Naval Attaché Rpt., 12 Feb. 1943.
45. Evaluation, Tab G, App. F; ORS Special Rpt. 1, Perforability of German Submarine Pens, 8 Dec. 1942.
46. ORS Special Rpt. 1, p. 3. Cf. Evaluation, Tab G, p. 3.
47. Analysis of Results. Admiralty was reported to be in agreement with conclusions arrived at in this paper.
48. USSBS Interview 59, Grand Adm. Karl Doenitz, 28 June 1945. Cf. AC/AS, Intel., Strategic Aerial Bombardment of Europe, 10 Dec. 1943.
49. See ORS Day Raid Rpts., in Tac. Mission Folders.
50. Interp. Rpt. K.1449, 16 Dec. 1942, in Tac. Mission Folder 24 (Lille, 6 Dec. 1942).
51. Ind. Dmg. Rpt. 63, 5 Jan. 1943.
52. *Ibid.*; Ind. Dmg. Rpt. 66, 23 Feb. 1943.
53. Tac. Mission Folders 17 (Lille, 8 Nov. 1942), 24 (Lille, 6 Dec. 1942).
54. ORS Day Raid Rpt. 29, 19 Feb. 1943, in Tac. Mission Folder 29 (Lille, 13 Jan. 1943); Ind. Dmg. Rpts. 66 (23 Feb. 1943), 74 (11 Nov. 1943); Interp. Rpt. F.S.85, 3 Feb. 1943, in Tac. Mission Folder 29 (Lille, 13 Jan. 1943).
55. Ind. Dmg. Rpt. 66.
56. Tac. Mission Folder 26 (Romilly, 20 Dec. 1942).
57. Intel. Narrative 26 and ORS Day Raid Rpt. 26, 2 Feb. 1943.
58. Rpt., USAAF Attack on Romilly, 20 Dec. 1942, n.d., in File 77 (Studies).
59. *Ibid.*
60. *Ibid.* See also Intel. Narrative 26.
61. Rpt., USAAF Attack on Romilly, 20 Dec. 1942, n.d.
62. CM-IN-10858, USAWW to AG-WAR, 239, 25 Nov. 1942.
63. See appropriate mission rpts. in Tac. Mission Folders.
64. Intel. Narrative 26.
65. Rpt., USAAF Attack on Romilly, 20 Dec. 1942, n.d.
66. Incl. to rpt., CG 8th AF to CG AAF, 3 Mar. 1943.
67. Hq. AAF, Statistical Sum., 8th AF Opns., 17 Aug. 1942-8 May 1945. Cf. A/P Status Rpts., BOLERO Papers; History, 2d Bomb. Div. (and 2d Bomb. Wing), Activation to 31 Dec. 1943, pp. 37-39.

68. Ltr., Spaatz to CG ETOUSA, 9 Nov. 1942.
69. CM-IN-4417 (11-11-42), London to AGWAR, 8, AFN 307A, 10 Nov. 1942; CM-OUT-2851 (7-11-42), WDOPD to USFOR, 10 July 1942. Cf. ltr., Spaatz to CG ETOUSA, 9 Nov. 1942; ltr., Spaatz to Stratemyer, 7 Nov. 1942.
70. CM-IN-825 (12-2-42), London to AGWAR, 1026, 2 Dec. 1942.
71. Ltr., Arnold to Eaker, 2 Dec. 1942; CM-OUT-4254 (11-13-42), AFDAS to CG 8th AF, A-753, 13 Nov. 1942.
72. See sources in n. 71.
73. A/P Status Rpts., BOLERO Papers; ltr., Eaker to Stratemyer, 30 Jan. 1943.
74. See ltr., Eaker to Stratemyer, 2 Jan. 1943.
75. ORS Day Raid Rpts.; CM-OUT-4874 (1-14-43), AFDMC to CG 8th AF, A-1335, 14 Jan. 1943.
76. History, VIII AFSC, chap. v, p. 117.
77. First 1100, II, 458; CM-IN-1368 (11-4-42), London to AGWAR, 408, 3 Dec. 1942.
78. Ltr., Spaatz to CG ETOUSA, 9 Nov. 1942.
79. History, VIII AFSC, chap. v, pp. 91 ff.
80. *Ibid.*, pp. 151 ff., especially p. 152.
81. Report of Lt. Gen. Ira C. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942, to Dec. 31, 1943 (hereinafter cited as Eaker Rpt.), Tab E, Exh. 3.
82. ORS Day Raid Rpts., *passim*. See also History, VIII AFSC, chap. v, p. 108.
83. Ltr., Eaker to Stratemyer, 2 Jan. 1943.
84. *Ibid.*; ORS Day Raid Rpts., *passim*; Eaker Rpt., Tab E, Exh. 3.
85. See cables, 8th AF; CM-IN-4417 (11-11-42), London to AGWAR, 8, AFN 307A, 10 Nov. 1942; Eaker Rpt., Tab E, Exh. 3.
86. Ltr., Eaker to Stratemyer, 2 Jan. 1943; CM-IN-10920 (1-24-43), USAWW to AGWAR, 516, 23 Jan. 1943; ORS Memo 13, 11 Jan. 1943; Eaker Rpt., Tab E, Exh. 3.
87. ORS Day Raid Rpt. 27A; History, 2d Bomb. Wing, pp. 35-36.
88. Opns. Anal. Sec., Hq. 8th AF, An Evaluation of Defensive Measures Taken to Protect Heavy Bombers from Loss and Damage, Nov. 1944, p. 3.
89. See History, 1st Bomb. Wing.
90. Evaluation of Defensive Measures, p. 36; First 1100, p. 395.
91. ORS Day Raid Rpt. 15; ltr., Eaker to CG 8th AF, 23 Oct. 1942, in Tac. Mission Folder 15; VIII BC Weekly Digest of Enemy Activity, 28 Oct. 1942.
92. Hq. USSAFE Air Staff Post Hostilities Intel. Requirements on German Air Force Tactical Employment, Sec. IV C, Fighter Operations of the GAF, Vol. II, App. XLII; CM-IN-10858 (11-25-42), USAWW to AGWAR, 239, 25 Nov. 1942; interview with Brig. Gen. H. S. Hansell, 9 Aug. 1943.
93. Evaluation of Defensive Measures, p. 36.
94. Fighter Operations of the GAF, I, 112.
95. Ltr., Eaker to Stratemyer, 2 Jan. 1943; 8th AF Weekly Intel. Digest, 2 Jan. 1943.
96. Evaluation of Defensive Measures, p. 94. These figures include bombers having received class E damage, which involved virtual destruction.
97. Interview with Lt. Col. E. H. Snively, 27 July 1943.
98. CM-IN-9057 (12-21-42), London to AGWAR, 183, 20 Dec. 1942.
99. CM-OUT-1338 (1-5-43), AFRDB to CG 8th AF, A-1260, 4 Jan. 1943.
100. Hansell interview; History, VIII AFSC, chap. v, pp. 118-19.
101. Evaluation of Defensive Measures, pp. 83, 89; interview with Col. L. C. Craigie, 12 Jan. 1943.
102. Hansell interview; History, 2d Bomb. Wing, p. 41; interview with Col. F. Armstrong, 24 Nov. 1942.
103. Armstrong interview. See also Evaluation of Defensive Measures, pp. 43-46; Tactical Doctrine, 1st Bomb. Wing, 1 Feb. 1943.
104. Tac. Doctrine, 1st Bomb. Wing, 1 Feb. 1943.
105. Evaluation of Defensive Measures, p. 46.
106. Ltr., Eaker to Arnold, 11 Jan. 1943; Armstrong interview; interview with Capt. H. L. Stouse, 10 Jan. 1943.
107. Ltr., Eaker to Arnold, 11 Jan. 1943; Craigie interview.
108. Paper sgd. Brig. Gen. A. J. Lyon, 8 Aug. 1942; Craigie interview; interview with Col. P. W. Tibbets, 20 Feb. 1943; rpt.

by Col. I. C. Eaker to C/AAF on trip to England, 30 Aug. to 1 Oct. 1941.

109. ORS Day Raid Rpts., *passim*; Evaluation of Defensive Measures, p. 94.

110. Tac. Doctrine, 1st Bomb. Wing, 1 Feb. 1943; Armstrong interview.

111. Armstrong interview.

112. *Ibid.*

113. Interview with Lt. Col. Leslie H. Arps, Dir., Opns. Anal. Div., 25 July 1945. Cf. CM-IN-6635 (12-16-42), London to AGWAR, 984, 15 Dec. 1942.

114. Interview with Lt. Col. Carl Norcross, 5 Jan. 1943; Craigie interview.

115. ORS Day Raid Rpts., *passim*; ORS, VIII BC, Preliminary Report on Bombing Accuracy, 4 Jan. 1943.

116. Prelim. Rpt. on Bomb. Accuracy.

117. *Ibid.*

118. Report on Perspective Maps, 31 May 1943.

119. Prelim. Rpt. on Bomb. Accuracy.

120. Craigie interview.

121. Eaker Rpt., p. 4.

122. First 1100, pp. 395-96.

123. Craigie interview; ltr., Stratemeier to Spaatz, 24 Dec. 1942.

124. Prelim. Rpt. on Bomb. Accuracy.

125. ORS Report on Advantage of Dropping on the Leader over Sighting Individually for Range When Bombing in Formation, 20 Mar. 1943, in Opns. Anal. Div. Rpts., Vol. I, No. 2.

126. Prelim. Rpt. on Bomb. Accuracy.

127. Tac. Doctrine, 1st Bomb. Wing, 1 Feb. 1943.

igns of the Eighth Air Force (hereinafter cited as AAFRH-2); ltr., Spaatz to Arnold, 23 Nov. 1942; ltr., Eaker to Arnold, 11 Jan. 1943; JCS 152, 16 Nov. 1942.

7. Ltr., Spaatz to Arnold, 3 Oct. 1942.

8. JCS 97/1, 11 Sept. 1942. Cf. JCS 152, 16 Nov. 1942.

9. Ltr., Spaatz to Arnold, 31 Oct. 1942.

10. JCS 97/1, 11 Sept. 1942. Cf. memo for Arnold from Portal, 20 Aug. 1942; History, 8th AF, II, 16.

11. Memo for Marshall from the President, 24 Aug. 1942.

12. AWPD-42, 9 Sept. 1942.

13. Ltr., Spaatz to Arnold, 11 Aug. 1942, in History, 8th AF, II, 9; ltrs., Spaatz to Arnold, 21, 27 Aug. 1942.

14. Ltr., Spaatz to Arnold, 31 Oct. 1942; ltr., Spaatz to Stratemeier, 30 Sept. 1942, quoted in R&R, AFCAS to Dir. of Air Defense, 5 Oct. 1942. Cf. ltr., Eisenhower to Marshall, 7 Oct. 1942.

15. Ltr., Spaatz to Arnold, 27 Aug. 1942; Minutes, Air Staff Mtgs., 5 and 26 Aug. 1942; memo for C/S from CG AAF, 29 July 1942.

16. Cf. JCS 152, 16 Nov. 1942; memo for S/W from Lovett, 15 Nov. 1942; memo for all staff dirs. from C/AS, 2 Dec. 1942.

17. Ltr., Stratemeier to Spaatz, 25 Aug. 1942. Cf. same idea in ltr., Arnold to Spaatz, 26 Aug. 1942.

18. Ltr., Kuter to Spaatz, 16 Sept. 1942. Cf. ltr., Spaatz to Kuter, 5 Oct. 1942.

19. JCS 97/1, incl. A, msg., Eisenhower to Marshall, 5 Sept. 1942.

20. *Ibid.*, incls. B, C, and D.

21. JPS 48, 28 Aug. 1942, subsequently circulated as JCS 97, 11 Sept. 1942.

22. AAF Reference History No. 1, The AAF in the South Pacific to October 1942 (hereinafter cited as AAFRH-1), pp. 112-13.

23. Notes on JPS 33d Mtg., 2 Sept. 1942 (ref. JPS 48).

24. Memo for C/S from Arnold, 29 July 1942.

25. Notes on JPS 33d Mtg., 2 Sept. 1942.

26. JCS 33d Mtg., 15 Sept. 1942 (ref. JCS 97/1).

27. JPS 48/1/D, 7 Oct. 1942, which consisted of the minutes of JCS 36th Mtg., 6 Oct. 1942.

28. JCS 33d Mtg., 15 Sept. 1942 (ref. JCS 97/1); JCS 36th Mtg., 6 Oct. 1942; JCS 37th Mtg., 13 Oct. 1942.

## NOTES TO CHAPTER 9

1. Memo for Marshall from Roosevelt, 6 May 1942.

2. JCS 26th Mtg., 28 July 1942 (ref. CCS 97); JCS 28th Mtg., 11 Aug. 1942 (ref. CCS 97/2); JPS 24th Mtg., 22 July 1942 (ref. CPS 35/1).

3. JCS 26th Mtg., 28 July 1942; JCS 28th Mtg., 11 Aug. 1942; CPS 26th Mtg., 24 July 1942 (ref. CPS 35/1).

4. JPS 24th Mtg., 22 July 1942.

5. CPS 26th Mtg., 24 July 1942; ltr., Spaatz to Arnold, 24 Aug. 1942; Notes on JPS 33d Mtg., 2 Sept. 1942 (ref. JPS 48), Tab A, memo for C/S from Arnold, 29 July 1942; CCS 94, 24 July 1942.

6. AAF Reference History No. 2, Or-

29. Memo for Leahy, King, Marshall, and Arnold from Roosevelt, 24 Oct. 1942.
30. Ltr., Spaatz to Arnold, 31 Oct. 1942; digest of conversation, Eisenhower and Spaatz, 29 Oct. 1942.
31. See sources in n. 30.
32. Memo for CG ETOUSA from Spaatz, 19 Nov. 1942 (cf. memo for CG ETOUSA from Spaatz, 14 Nov. 1942); Minutes, Mtg. at Hq. 8th AF of Gens. Spaatz, Eaker, Kuter, Hansell, *et al.*, 23 Nov. 1942.
33. Ltr., Arnold to Spaatz, 15 Nov. 1942; ltr., Arnold to Eisenhower, 15 Nov. 1942.
34. Ltr., Spaatz to Arnold, 23 Nov. 1942.
35. Report of Lt. Gen. Ira C. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942, to Dec. 31, 1943 (hereinafter cited as Eaker Rpt.), Tab C, P. 3.
36. Msg., Eisenhower to Maj. Gen. W. B. Smith and Maj. Gen. Sir H. L. Ismay, 3 Dec. 1942; ltr., Eaker to Stratemyer, 6 Dec. 1942.
37. Memo for CG AAF from AC/AS, Plans, 2 Dec. 1942; memo for OPD from AC/AS, Plans, 3 Dec. 1942; R&R, AFCAS to AFAEP, 20 Dec. 1942, comment 2, AFAEP to AFCAS, 28 Dec. 1942; ltr., Arnold to Spaatz, 30 Dec. 1942. At one point AAF Headquarters appears to have found Eisenhower's stopgap measures confusing. (R&R, Arnold to Stratemyer, 17 Dec. 1942.)
38. Ltr., Arnold to Portal, 10 Dec. 1942. Cf. ltr., Stratemyer to Spaatz, 11 Dec. 1942; ltr., Arnold to Hopkins, 16 Dec. 1942; R&R, Arnold to Stratemyer, 17 Dec. 1942, comment 3, AFAEP to AFCAS, n.d.
39. Ltr., Arnold to Spaatz, 30 Dec. 1942.
40. CCS 124, 18 Nov. 1942; Notes on JCS 42d Mtg., 17 Nov. 1942 (ref. JCS 152), and Tab A, memo for C/S from Maj. Gen. T. T. Handy, 8 Nov. 1942; CPS 40th Mtg. (3 Dec. 1942), 41st Mtg. (4 Dec. 1942). Cf. CCS 55th Mtg., 14 Jan. 1943 (Casablanca).
41. Incl. to JCS 153, 18 Nov. 1942; memo for JCS from Joint Strategic Survey Comm., 27 Nov. 1942. Cf. CCS 57th Mtg., 15 Jan. 1943 (Casablanca); Casablanca Conf., 2d Mtg., 18 Jan. 1943.
42. CPS 49/1, 27 Nov. 1942.
43. Incl. B, minority rpt. by member of USAAF, to CPS 49/1, 27 Nov. 1942. Cf. CPS 49/2, 5 Dec. 1942.
44. JCS 152, 16 Nov. 1942.
45. AAF Hq., Plan for the Defeat of the Axis Powers, 1 Dec. 1942.
46. CCS 124/1, 30 Dec. 1942. Cf. CPS 49/3, 8 Dec. 1942.
47. Ltr., Spaatz to CG ETOUSA, 9 Nov. 1942. Cf. Plans Div. Digest, 5 Dec. 1942.
48. Directive, Eisenhower to Spaatz, 5 Jan. 1943. Cf. msg., Eisenhower to CCS and British COS, 4 Jan. 1943; CCS 139, 5 Jan. 1943.
49. Ltr., Arnold to Spaatz, 30 Dec. 1942.
50. Ltr., Eaker to Arnold, 11 Jan. 1943.
51. Ltr., Arnold to Spaatz, 28 Dec. 1942.
52. JCS 30, 1 May 1942. Cf. ltr., Roosevelt to Donald M. Nelson, 1 May 1942.
53. See CCS 97 series. Cf. JPS 45, 15 Aug. 1942; JPS 29th Mtg., 19 Aug. 1942; Notes on JPS 33d Mtg., 2 Sept. 1942 (ref. JPS 51/D).
54. JCS 43d Mtg., 24 Nov. 1942 (ref. JCS 134/2).
55. AWPD-42, 9 Sept. 1942.
56. *Ibid.*
57. Plan for Defeat of Axis Powers, 1 Dec. 1942.
58. Ltr., Kuter to Spaatz, 16 Sept. 1942; Minutes, AS Mtg., 29 Sept. 1942; JCS 43d Mtg., 24 Nov. 1942 (ref. JCS 134/2); ltr., Kuter to Hansell, 30 Sept. 1942.
59. Ltr., Kuter to Spaatz, 16 Sept. 1942; JCS 38th Mtg., 20 Nov. 1942 (ref. JCS 134); JCS 41st Mtg., 10 Nov. 1942 (ref. JCS 146).
60. JCS 134, 19 Oct. 1942, and incl. C, dtd. 15 Oct. 1942.
61. *Ibid.*
62. JCS 38th Mtg.
63. Ltr., President to Nelson, 29 Oct. 1942.
64. JCS 134/3, 26 Nov. 1942.
65. JCS 30, 5 Apr. 1942; JCS 41st Mtg.
66. Memo for Col. E. C. Langmead, 25 Nov. 1942; JCS 43d Mtg., 24 Nov. 1942.
67. JCS 41st Mtg., 10 Nov. 1942. See also JCS 146 series, *passim*; memo for AC/AS, Plans from AC/AS, A-4, 20 Nov. 1942.
68. JCS 146 series, *passim*. See especially, JCS 41st Mtg., 10 Nov. 1942; JCS 146/2, 24 Nov. 1942; JCS 146/7, 7 Dec. 1942.
69. Memo for Col. Langmead, 25 Nov. 1942; JCS 45th Mtg., 8 Dec. 1942 (ref. JCS 146/7); JCS 186, 4 Jan. 1943.

70. JPS 51/1, 20 Oct. 1942; JPS 43d Mtg., 28 Oct. 1942 (ref. JPS 51/1); JPS 44th Mtg., 4 Nov. 1942; JCS 41st Mtg., 10 Nov. 1942, and attached notes.
71. See sources in n. 70, especially JPS 43d Mtg., 28 Oct. 1942; JCS 41st Mtg., 10 Nov. 1942. See also memo for Col. Langmead, 25 Nov. 1942.
72. JCS 43d Mtg., 24 Nov. 1942.
73. JCS 146, 5 Nov. 1942.
74. JCS 41st Mtg., 10 Nov. 1942.
75. JCS 146/1, 17 Nov. 1942, Tab A; JCS 146/2, 24 Nov. 1942, and attached papers.
76. JCS 43d Mtg., 24 Nov. 1942.
77. JCS 146/5, 30 Nov. 1942, containing ltr., Leahy to Nelson, 26 Nov. 1942. See also attached papers, especially R&R, AFDAS to A-4, 5 Dec. 1942.
78. JCS 146/6, 5 Dec. 1942.
79. JCS 186, 4 Jan. 1943.
80. JPS 62d Mtg., 3 Mar. 1943 (ref. JPS 51/5); JCS 186/1, 6 Jan. 1942; JCS 54th Mtg., 18 Jan. 1943 (Casablanca); memo for CG AAF from Brig. Gen. B. E. Meyers, 25 Mar. 1943; ltr., Lovett to Harry Hopkins, 25 Mar. 1943; JCS 146/16, 6 May 1943; JCS 416/2, 10 June 1943.
81. JCS 45th Mtg., 8 Dec. 1942, and attached notes; ltr., Lovett to Harris, 28 Apr. 1943.
82. Ltr., Eaker to Arnold, 11 Jan. 1943; ltr., Eaker to Stratemyer, 8 Oct. 1942.
83. Draft attached to R&R, AFDAS to AFABI, 11 Oct. 1942.
84. Ltr., Arnold to Eaker, 18 Nov. 1942.
85. R&R, AFCAS to Dir. of Bomb., 25 Nov. 1942; R&R, AFCAS to Col. C. P. Cabell, 19 Nov. 1942.
86. R&R, AFDMR to AFRGS, 14 Sept. 1942; ltr., Stratemyer to Spaatz, 30 Sept. 1942; rpt. by Capt. E. V. Rickenbacker to S/W, 12 Oct. 1942.
87. AFSHO Special File 77 (ltrs.).
88. Memo for S/W from Lovett, 15 Nov. 1942. The subject paper is no longer attached to the memo, but is summarized therein.
89. Plan for Defeat of Axis Powers, 1 Dec. 1942. Cf. R&R, AFABI to AFDIS, 27 Sept. 1942.
90. Memo for Marshall from Arnold, 22 Aug. 1942. Cf. R&R, AFCAS to AFDMR, 19 Aug. 1942.
91. Hq. AAF, Dir. of Intel. Service,

- Special Studies of Bombing Results 1-3, 19 Oct. 1942.
92. Ltr., Eaker to Arnold, 6 Dec. 1942; R&R, AFCAS to AC/AS, A-2, 21 Dec. 1942; ltr., Arnold to Eaker, 2 Jan. 1943.
  93. Ltr., Spaatz to Stratemyer, 14 Sept. 1942; ltr., Stratemyer to Spaatz, 30 Sept. 1942.
  94. Ltr., Eaker to Spaatz, 8 Oct. 1942; ltr., Eisenhower to Marshall, 7 Oct. 1942.
  95. CCS 155/1, 19 Jan. 1943. Cf. CCS 169, 22 Jan. 1943; CCS 58th Mtg., 16 Jan. 1943.
  96. CCS 155/1; CCS 57th Mtg., 15 Jan. 1943.
  97. CCS 55th Mtg., 14 Jan. 1943; CCS 57th Mtg., 15 Jan. 1943; Casablanca Conf., 2d Mtg., 18 Jan. 1943; CCS 169; JCS conf. with the President, 16 Jan. 1943.
  98. JCS conf. with President, 16 Jan. 1943.
  99. Eaker Rpt., p. 7; ltr., Eaker to Stratemyer, 30 Jan. 1943.
  100. Eaker Rpt., Tab E, Exh. 3.
  101. *Ibid.*
  102. Harry C. Butcher ms. (for *My Three Years with Eisenhower*), entry for 17 Jan. 1943.
  103. JCS conf. with President, 15 Jan. 1943; Casablanca Conf., 2d Mtg.; JCS 56th Mtg., 20 Jan. 1943; CCS 65th Mtg., 21 Jan. 1943. Cf. JCS 51st Mtg., 14 Jan. 1943.
  104. CCS 55th Mtg.; CCS 65th Mtg.; CCS 155/1.
  105. See sources in n. 104.
  106. CCS 55th Mtg.; CCS 58th Mtg., 16 Jan. 1943; JCS conf. with President, 16 Jan. 1943.
  107. CCS 65th Mtg.
  108. *Ibid.*
  109. Memo for Maj. Gen. B. M. Giles, 8 Sept. 1943.
  110. *Ibid.*
  111. File 77 (Study).

## NOTES TO CHAPTER 10

1. Hq. AAF, Statistical Summary of Eighth Air Force Operations, European Theater, 17 Aug. 1942 to 8 May 1945, 10 June 1945 (hereinafter cited as Stat. Sum., 8th AF).
2. Figures have been taken from Stat. Sum., 8th AF, and from Tactical Mission Reports (hereinafter cited as T/M Rpts.).
3. Stat. Sum., 8th AF, p. 14; CM-IN-1215 (2-3-43), London to AGWAR, 977,



2 Feb. 1943; ltr., Eaker to Stratemyer, 19 Feb. 1943; rpt., Brig. Gen. F. L. Anderson, n.d., quoted in excerpt in R&R, Dir. of Bomb. to AC/AS, A-3, 12 Feb. 1943. For the problem of crew morale, see interview with Brig. Gen. H. S. Hansell, 9 Aug. 1943.  
4. CM-IN-302 (3-1-43), USAWW to WAR, 55, 1 Mar. 1943; CM-IN-2926 (4-5-43), London to WAR, 8463, 5 Apr. 1943. Cf. ltr., Anderson to Stratemyer, 2 Mar. 1943.

5. AFSHO Special File 77 (ltrs.).

6. *Ibid.* (msg.).

7. CM-OUT-3936 (3-11-43), AC/AS, AFDPD to CG ETO, R6562, 11 Mar. 1943.

8. The following extract from the summary of tentative assignment of tactical units, made in accordance with Revised Troop Basis, ETOUSA, and dated 16 January 1943, shows the monthly quotas planned at that time for the Eighth Air Force in heavy bomber groups:

Units remaining in U.K. after withdrawal for special operations: 7

Month	Quota	Month	Quota
Jan.	2	May	2
Feb.	2	June	2
Mar.	1	July	2
Apr.	1	Aug.	1

9. JCS 238/3, 21 Mar. 1943; CM-IN-13932 (3-26-43), London to AGWAR, 8194, 26 Mar. 1943; CM-IN-7241 (2-14-43), London to WAR, 7248, 14 Feb. 1943; CM-OUT-5113 (2-15-43), Hq. AAF, A-3 to London, R5889, 15 Feb. 1943; CM-OUT-2033 (4-5-43), AFAEP to CG ETO, R7303, 5 Apr. 1943; ltr., Stratemyer to Eaker, 8 Mar. 1943; ltr., Arnold to Eaker, 15 Mar. 1943; ltr., Lovett to Harris, 28 Apr. 1943.  
10. Ltr., Stratemyer to Eaker, 7 Feb. 1943; CM-IN-2562 (2-5-43), London to WAR, 6989, 5 Feb. 1943; CM-IN-2178 (4-4-43), London to WAR, 8433, 3 Apr. 1943; ltr., Eaker to Stratemyer, 26 Feb. 1943.

11. Ltr., Stratemyer to Eaker, 7 Feb. 1943; memo for Arnold from AC/AS, Plans, 25 Apr. 1943; CM-OUT-2033 (4-5-43), Hq. AAF to CG ETO, R7307, 5 Apr. 1943. The direct effect of diversions, as far as heavy bombers were concerned, was felt mainly in the B-24's, which were considered more suitable than the B-17's for service in the Pacific and Asiatic areas and for antisubmarine patrol. (Form SC-X-62's

for Feb., May, and June 1943 [HB Allocations]. See also AAF Reference History No. 7, The Antisubmarine Command [hereinafter cited as AAFRH-7].)

12. AAFRH-7.

13. Stat. Sum., 8th AF, p. 14.

14. Target Sec., Dir. of Intel., 8th AF, "Target Priorities of the Eighth Air Force, a Résumé of the Bombardment Directives and Concepts Underlying Them," 15 May 1945.

15. Intel. Service, Hq. AAF, An Evaluation of the Air Effort against Submarines, 8 Mar. 1943 (hereinafter cited as Evaluation).

16. Beginning with February, cables during this period which report Eighth Air Force missions to submarine or other objectives in occupied territory usually state that, weather conditions having made missions to Germany impossible, targets in occupied countries had been selected. (E.g., CM-IN-14209 [2-28-43], USAWW to WAR, 10, 27 Feb. 1943.)

17. Evaluation; info. supplied by British Air Ministry, Air Hist. Br. (hereinafter cited as BAM [AHB]).

18. Info. supplied by BAM (AHB); USSBS, Munitions Div., Submarine Br., German Submarine Industry, 3 Nov. 1945.

19. USSBS, German Sub. Ind.

20. T/M Rpts. 31, 37, 46, 56, 59.

21. *Ibid.*, 45; Ind. Dmg. Rpt. 69, 30 Apr. 1943.

22. USSBS, Munitions Div., Submarine Br., Bremer Vulkan, Vegesack, Germany, 30 Oct. 1945.

23. USSBS, German Sub. Ind.

24. *Ibid.*

25. T/M Rpts. 30, 36, 38, 40, 51, 53, 55, 58, 61.

26. Info. supplied by BAM (AHB).

27. OSS Rpt., 15 Mar. 1943; T/M Rpt. 61. See especially Interp. Rpt. K.S. 87A, 22 June 1943.

28. Quoted in USSBS, German Sub. Ind., p. 19.

29. *Ibid.*

30. Naval Attaché Rpt., 17 Feb. 1943.

31. AC/AS, Intel., Summary of Eighth AF Heavy Bomber Operations as Called for in the CBO Plan, First Phase, 1 July 1943. Cf. Navy Intel. Rpt., London, 6 May 1943, which embodied the report of a Polish official who was supposed to have had information from an eyewitness.

32. AC/AS, Intel., The Strategic Aerial Bombardment of Europe, 10 Dec. 1943.
33. AAF Eval. Bd., ETO, Rpt. of 28 Oct. 1944.
34. USSBS, Sub. Ind. Rpt.; USSBS Interview 59, Grand Adm. Karl Doenitz, 28 June 1945.
35. USSBS, Sub. Ind. Rpt.
36. T/M Rpts. 43, 50, 52, 55, 56, 58.
37. USSBS, Airframes Plant Rpt. 5, Focke-Wulf Aircraft Plant, Bremen. Cf. 8th AF Semimonthly Rpt., 1-15 June 1943.
38. T/M Rpts. 39, 41, 42, 43, 47; ltr., Eaker to Arnold, 15 Mar. 1943.
39. T/M Rpts. 41, 42, 47; Ind. Dmg. Rpt. 69, 30 Apr. 1943; OSS Rpt. 881/43, 7 Apr. 1943; additional data from BAM (AHB).
40. Ind. Dmg. Rpt. 74, 11 Nov. 1943.
41. Info. supplied by BAM (AHB).
42. T/M Rpts. 49, 54, 56; Ind. Dmg. Rpts. 70 (29 May 1943), 72 (12 Aug. 1943).
43. USSBS, Munitions Div. Rpt. 2, Renault Motor Vehicle Plant at Billancourt (Paris), France.
44. *Ibid.* Cf. 8th AF Semi-Monthly Rpts. for 16-31 July and 1-15 Aug. 1943.
45. See CCS 166/2, 15 May 1943, and incl. msg. 9013, Andrews to Marshall, 23 Apr. 1943.
46. Navy Intel. Rpt., 9 Dec. 1943; OSS Rpts. P.1/4061 (9 Feb. 1943), P.1/4651 (25 Mar. 1943).
47. U.S. Liaison Rpt. from France, 23 Apr. 1943.
48. *Ibid.*; Navy Intel. Rpt., 9 Dec. 1943.
49. JCS 341, 27 May 1943.
50. Navy Intel. Rpt., 9 Dec. 1943.
51. CCS 166/2; CCS 166/3 (embodying proposals presented originally as JCS 341), 2 June 1943; CCS 97th Mtg., 4 June 1943; memo for all AC/AS from C/AS, 30 Apr. 1943. See also ltr., Eaker to Portal, 22 Apr. 1943; ltr., Andrews to Arnold, 28 Apr. 1943; correspondence attached to ltr., Eaker to Maj. Gen. I. H. Edwards, C/S ETOUSA, 8 June 1943.
52. Ltr., Eaker to Stratemeyer, 19 Feb. 1943; CM-IN-4057 (3-8-43), USSOS to WAR, 300, 8 Mar. 1943.
53. Ltr., Col. B. E. Beaman to CG VIII BC, 15 May 1943; memo for Andrews, 24 Apr. 1943.
54. T/M Rpts.
55. Eaker Rpt.
56. Ltr., Eaker to Arnold, 15 Feb. 1943; ltr., Andrews to Arnold, 26 Feb. 1943.
57. Hansell interview; interview with crew of 324th Sq., 91st Bomb. Gp., 19 Mar. 1943; ltr., Eaker to Andrews, 27 Feb. 1943.
58. T/M Rpt. 31.
59. *Ibid.*; 8th AF Weekly Air Intel. Sum., 13 Feb. 1943.
60. T/M Rpt. 32.
61. *Ibid.*, 37.
62. *Ibid.*
63. *Ibid.*
64. *Ibid.*, 36, 37, 46.
65. *Ibid.*, 39; CM-IN-2432 (3-5-43), USAWW to WAR, 221, 5 Mar. 1943; ORS Day Raid Rpt. 39.
66. T/M Rpts., *passim*.
67. CM-IN-14665 (2-28-43), USAWW to WAR, 41, 28 Feb. 1943.
68. T/M Rpt. 45; CM-IN-11505 (3-22-43), USFOR to WAR, 771, 21 Mar. 1943; CM-IN-10753 (3-20-43), USAWW to WAR, 707, 19 Mar. 1943; ltr., Eaker to Arnold, 19 Mar. 1943; ltr., Eaker to Longfellow, 24 Mar. 1943.
69. T/M Rpts. 30, 36, 38, 40.
70. *Ibid.*
71. *Ibid.*
72. *Ibid.*, 39, 41, 42, 43, 47, 48; ORS Day Raid Rpt. 43.
73. T/M Rpt. 43; 8th AF and AAF Eval. Bd., ETO, Eighth AF Tactical Development, Aug. 1942 to May 1945, 9 July 1945, chap. ii.
74. T/M Rpt. 41.
75. *Ibid.*, 49, 50, 51.
76. *Ibid.*
77. *Ibid.*, 52; CM-IN-12237 (4-20-43), USFOR to WAR, 867, 20 Apr. 1943.
78. T/M Rpt. 52.
79. *Ibid.*
80. 8th AF Tac. Devel., chap. i. Cf. interview with Col. S. T. Wray, VIII BC, 20 Aug. 1943.
81. T/M Rpt. 52. Information supplied through courtesy of British Air Ministry from records of General Quartermaster's Department, German Air Ministry.
82. 8th AF Tac. Devel., chap. v. Cf. ltr., Eaker to Arnold, 11 Jan. 1943; memo for CG AAF from AC/AS, Intel., European Theater Officer, 6 Apr. 1943.
83. USSBS, Military Analysis Div., The Defeat of the German Air Force; 8th AF Tac. Devel., chap. v.
84. USSBS, Defeat of GAF. Opns. Anal. Sec., Hq. 8th AF, An Evaluation of Defensive Measures Taken to Protect Heavy

Bombers from Loss and Damage, Nov. 1944, p. 94, gives 18.9 per cent for the month of June 1943. (See also T/M Rpts., *passim*; ltr., Lt. Col. R. L. Curtice to CG VIII BC, 7 June 1943.)

85. Memo for Dir. of Bomb. from Brig. Gen. F. L. Anderson, 31 Jan. 1943; interview with Capt. H. L. Stouse, 10 June 1943.

86. See T/M Rpts., especially 38, 42, 43.

87. Memo for Dir. of Bomb. from Anderson, 31 Jan. 1943; ltr., Stratemyer to Eaker, 7 Jan. 1943; Hq. VIII BC Intel. Memo, 3 May 1943.

88. History, VIII FC, Aug. 1942-Apr. 1945; 8th AF Tac. Devel., chap. ii; Eaker Rpt., Tab C; CM-IN-4168 (3-9-43), USAWW to WAR, 331, 8 Mar. 1943; CM-IN-450 (2-2-43), London to WAR, 933, 1 Feb. 1943; ltr., Stratemyer to Eaker, 7 Jan. 1943; msg. 408, Allied AF to AGWAR, 25 Jan. 1943; ltr., Eaker to Giles, 13 May 1943; CM-IN-5642 (5-9-43), USAWW to WAR, 815, 8 Mar. 1943; CM-IN-5880 (3-12-43), USAWW to WAR, 427, 11 Mar. 1943; CM-IN-7903 (3-15-43), USAWW to WAR, 570, 15 Mar. 1943.

89. CM-IN-10127 (4-17-43), USAWW to USFOR, 744, 17 Apr. 1943; History, VIII FC.

90. 8th AF Tac. Devel.; Eaker Rpt., Tab C; ltr., Eaker to Giles, 13 May 1943; CM-IN-5642 (5-9-43).

91. CM-IN-7811 (4-14-43), USFOR to WAR, 375, 8 Apr. 1943; ltr., Eaker to Giles, 17 Apr. 1943.

92. T/M Rpt. 54; History, VIII FC.

93. T/M Rpts. 55, 56.

94. *Ibid.*, 61. Cf. Hq. VIII BC Intel. Memo, 3 May 1943.

95. T/M Rpt. 60.

96. *Ibid.*, 56, 57, 58, 59.

97. Stat. Sum., 8th AF.

98. Ltr., Eaker to Arnold, 13 May 1943.

99. T/M Rpt. 56.

100. *Ibid.*

101. *Ibid.*; CM-OUT-4825, CG AAF to CG ETO, R6631, 12 Mar. 1943; CM-IN-8565 (3-17-43), USAWW to WAR, 607, 16 Mar. 1943; ltr., Eaker to Portal, 4 Mar. 1943.

102. T/M Rpt. 56.

103. *Ibid.*, 58; ltr., Eaker to Giles, 28 May 1943; CM-IN-18992 (5-29-43), USAWW to WAR, D-1184, 29 May 1943; Col. Har-

old A. McGinnis, IG, Rpt. to CG 8th AF, 7 June 1943.

104. These figures are taken where possible from Stat. Sum., 8th AF. However, some breakdowns in Evaluation of Defensive Measures, compiled by ORS, Eighth Air Force, are handier and have consequently been used. The two sources seldom agree in detail, but they are usually not far enough apart to affect any general conclusions based on them.

105. See sources in n. 104.

106. Opns. Anal. Div. Rpts., Vol. I, No. 2, ORS Rpt. on Advantage of Dropping on the Leader over Sighting Individually for Range When Bombing in Formation, 20 Mar. 1943; *ibid.*, No. 3, ORS Memo as to Desirability of Shortening Group Bomb-fall Patterns . . . , 7 May 1943. See also ORS Rpt., Analysis of VIII Bomber Command Operations from the Point of View of Bombing Accuracy, 1 Jan.-15 Oct. 1943.

107. Ltr., Eubank to Eaker, 31 Mar. 1943; interview with Lt. Col. J. B. Montgomery, 13 Apr. 1943; CM-IN-14043 (4-23-43), USAWW to WAR, 5656, 23 Apr. 1943; CM-OUT-9045 (3-24-43), CG AAF to CG 8th AF, A-1873, 23 Mar. 1943.

108. See sources in n. 107. See also ORS Rpt., VIII BC Bombing Accuracy, 1 Jan.-15 Oct. 1943.

109. ORS Rpt., VIII BC Bombing Accuracy, 1 Jan.-15 Oct. 1943.

110. *Ibid.*; see also T/M Rpts., *passim*.

111. T/M Rpts., especially 59, 60.

112. *Ibid.* Cf. ORS Rpt., Comparison of Bombing Results in Relation to the Order in Which Participating Groups Reached the Targets, 12 May 1943.

113. T/M Rpts. 56, 57, 59; CM-IN-18701 (5-29-43), USAWW to WAR, D-1174, 28 May 1943.

114. Interview with A/Cdre. A. C. H. Sharpe, 12 Oct. 1943.

115. CM-IN-10753 (3-20-43), USAWW to WAR, 707, 19 Mar. 1943; ltr., Eaker to Arnold, 19 Mar. 1943; CM-OUT-8161 (3-22-43), CG AAF to CG ETO, R6840, 22 Mar. 1943.

116. Allan A. Michie, *The Air Offensive against Germany* (New York, 1943).

117. *New York Herald Tribune*, 19 Feb. 1943, editorial. Cf. memo for Arnold from Lovett, 19 Feb. 1943, and attached ltr., AVM W. F. MacN. Foster to Arnold, 22 Feb. 1943; CM-IN-95731 (1-21-43), US-

FOR to AGWAR, 6595, 21 Jan. 1943. See also memo for Stratemyer from Col. E. P. Sorensen, 13 Apr. 1943 and ltr., Francis Drake to Eaker, 7 Apr. 1943.

118. Ltr., Eaker to Lovett, 8 Apr. 1943.

119. *New York Sun*, 29 Apr. 1943, quoted in ltr., Eaker to Portal, 13 May 1943.

120. Interview with Maj. James Parton, aide to Eaker, 28 Nov. 1943; 8th AF Commanders' Mtg., 19 Apr. 1943; ltr., Eaker to Harris, 31 May 1943; ltr., Devers to Marshall, 1 June 1943.

#### NOTES TO CHAPTER 11

1. Gen. Giulio Douhet, *The Command of the Air* (New York, 1942), pp. 50, 59-60, as quoted by Brig. Gen. E. P. Sorensen, AC/AS, Intel., in "Air Force Objectives," an address delivered before the Army-Navy Staff College, 13 Aug. 1943.

2. The following analysis is adapted from the more or less official account contained in "Air Force Objectives."

3. Information supplied by British Air Ministry, Air Hist. Br. (hereinafter cited as BAM [AHB]).

4. Col. Guido R. Perera, History, Organization and Operations of the Committee of Operations Analysts (hereinafter cited as History, COA), p. 3. Considerable light has been thrown on this phase of the subject by Lt. Col. Malcolm W. Moss, then chief of the target information section, A-2, and by Edward M. Earle of the Institute for Advanced Studies, Princeton.

5. See copies of Air Estimates in A-2 Library.

6. *Ibid.*

7. History, COA, p. 1. Cf. AWPD-42, 9 Sept. 1942.

8. Directive, Arnold to AC/AS, Management Control, 9 Dec. 1942, in Report of Committee of Operations Analysts, 8 Mar. 1943 (hereinafter cited as COA Rpt.).

9. *Ibid.*

10. *Ibid.*; History, COA, pp. 3-4.

11. History, COA, pp. 6 ff.

12. See COA Papers.

13. *Ibid.*, file entitled COA General.

14. *Ibid.* Cf. reports to COA by subcommittees on the various industries examined.

15. History, COA, pp. 32 ff.

16. See subcommittee rpts.

17. COA Rpt., 8 Mar. 1943. This report

serves as the basis for the text through note 35.

18. Interview with Edward M. Earle, 7 Nov. 1945; History, COA, pp. 42-44.

19. Cf. USSBS, *Over-all Report (European War)* (Washington, 1945).

20. *Ibid.*

21. *Ibid.*

22. *Ibid.* Cf. Rpt. to COA by Subcommittee on Axis Oil Industry.

23. See COA Papers.

24. USSBS, *Over-all Rpt.* Cf. Rpt. on Axis Oil Industry.

25. USSBS, *Over-all Rpt.*

26. *Ibid.*

27. *Ibid.* Cf. Rpt. to COA by Subcommittee on Western Axis Rubber Industry, 17 Feb. 1943.

28. USSBS, *Over-all Rpt.*

29. *Ibid.* Cf. AC/AS, Intel., The Strategic Aerial Bombardment of Europe, 10 Dec. 1943, which comes to a similar conclusion.

30. USSBS, *Over-all Rpt.*

31. *Ibid.*

32. *Ibid.*

33. *Ibid.*

34. *Ibid.*

35. *Ibid.*

36. History, COA, pp. 45-46; Report of Lt. Gen. Ira C. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942, to Dec. 31, 1943 (hereinafter cited as Eaker Rpt.), Tab E, p. 3.

37. AFSHO Special File 77 (ltrs.).

38. Eaker Rpt., Tab E, p. 3. Cf. History, COA, p. 44.

39. The Attack on the GAF, 9 Apr. 1943, in File 77 (studies).

40. Eaker Rpt., Tab E; ltr., Incl. A to CCS 217, 14 May 1943; ltr., Arnold to Portal, 2 Apr. 1943; ltr., Eaker to Portal, 2 Apr. 1943.

41. File 77 (ltrs.).

42. History, COA, p. 46.

43. JCS Special Mtg., 29 Apr. 1943 (ref. JCS 277). This paper, presented by Eaker, became JCS 277/1 and is substantially the one finally adopted as CCS 217, which has been used as the basis for the analysis of the CBO Plan herein following.

44. *Ibid.*

45. AWPD-1, 12 Aug. 1941.

46. JCS 277, 29 Apr. 1943. The schedule here proposed differed from that presented by Eaker only in the first phase when 864

rather than 944 heavy bombers were projected.

47. JCS 77th Mtg., 4 May 1943.
48. CCS 217, 14 May 1943; CCS 215, 13 May 1943.
49. CCS 85th Mtg., 15 May 1943; CCS 87th Mtg., 18 May 1943; CCS 219, 14 May 1943; CCS 232/1, 18 May 1943.
50. CCS 85th Mtg.; CCS 87th Mtg.
51. CCS 87th Mtg.
52. CCS 242/6, 25 Mar. 1943.
53. Eaker Rpt., Tab E, Exh. 8; CCS 138, 2 Jan. 1943.
54. Ltr., Arnold to Eaker, 22 Apr. 1943.
55. Eaker Rpt., Tab E, Exh. 10; interview with A/Cdre. A. C. H. Sharpe, DC/S, 8th AF, 12 Oct. 1943.
56. Info. supplied by BAM (AHB). On the COPC, see Minutes of Commanders' Conf. at COPC, PINETREE, 31 July 1943.
57. JCS 313, 12 May 1943.
58. CCS 83d Mtg., 13 May 1943; CCS 235, 18 May 1943.
59. CCS 244/1, 25 May 1943, Annex IV, App. A.
60. History, VIII AFSC, chap. iv, p. 6.

## NOTES TO CHAPTER 12

1. Msg., COMINCH and C/S to CG EDC, 25 Mar. 1942; memo for CG EDC from AC/S, OPD, 20 May 1942.
2. AAFAC Monthly Intel. Sum., Nov. 1942; rpt. by Maj. A. Standish to S/W for Air, 1 Dec. 1943 (hereinafter cited as Standish Rpt.), p. 18; station lists and strength rpts. in AAF Reference History No. 7, The Antisubmarine Command (hereinafter cited as AAFRH-7), Apps. 4 and 5.
3. ONI, The Conduct of the War at Sea (translation of essay by Adm. Karl Doenitz), 15 Jan. 1946. Cf. USSBS Interview 59, Grand Adm. Doenitz, 28 June 1945.
4. Ltr., Marshall to King, 14 Sept. 1942, in rpt. by Dr. E. L. Bowles to S/W, The Acute Problem of Ocean-Borne Transport and Supply (hereinafter cited as Bowles Rpt.), 3 Mar. 1943, Tabs XIII, XIV A; memo for S/W from Bowles, 7 Aug. 1942; ltr., AAG to Brig. Gen. W. T. Larson, 28 Dec. 1942, quoted in Standish Rpt., p. 17; JCS 93, 1 Sept. 1942; JCS 93/1, 19 Oct. 1942.
5. Ltr., TAG to CG AAF, 17 Nov. 1942; ltr., Maj. Bower to CG AAF, 6 Jan. 1943.

The figure "nineteen" is taken from JCS 93/1.

6. Ltr., CG AAFAC to CG AAF, 6 Jan. 1943, and 1st ind., n.d.; R&R, AFDTS to AC/AS, A-3, 6 Jan. 1943.
7. For background on this point, see Vol. I of this series, chap. 15.
8. Memo, Dr. P. M. Morse, ASWORG to AFDTS, 20 Jan. 1943; unofficial memo, Morse to Larson, 5 Jan. 1943; memo for JCS from Joint U.S. Committee on New Weapons and Equipment (JCNW), 4 Jan. 1943; memo for JCNW to DC/S, 6 Jan. 1943. Cf. memo for McNarney from Brig. Gen. H. M. McClelland, AFDTS, 23 Jan. 1943.
9. Memo for CG AAF from Brig. Gen. C. W. Russell, 3 Nov. 1942, in Three Historical Essays Relating to Army Antisubmarine Activities, 26 Apr. 1944 (hereinafter cited as Three Essays), Tab II C; memo for CG AAF from Russell, n.d. but prob. Jan. 1943. Cf. memo for Sec. of Navy from King, 5 Apr. 1943, in Bowles' papers, in which he expressed an almost identical position.
10. 1st ind., Hq. AAF to Russell, 6 Feb. 1943, to brief of memo for CG AAF from Russell, n.d. See also ltr., C/S to COMINCH, 17 July 1942; memo for C/S U.S. Army from Lt. Gen. B. H. Somervell, 5 Oct. 1942, in which the CG AAF urges bombing of submarine bases and yards as the principal target for the Eighth Air Force and a necessary prerequisite to successful logistical operations in the ETO; ltr., Arnold to Slessor, 4 Dec. 1942.
11. AAFAC, Monthly Intel. Rpts., June 1943, p. 20, and Aug. 1943, p. 13; paper, Air Offensive against the U-boats in Transit, filed under 10 Mar. 1943.
12. Air Offensive against the U-boats in Transit.
13. Unsigned memo for Brig. Gen. J. E. Upston, n.d. but prob. early Feb. 1943.
14. Three Essays, II, 16.
15. *Ibid.*
16. R&R, AFAEP to AFABI, 28 Dec. 1942; Intel. Service, Hq. AAF, An Evaluation of the Air Effort against Submarines, 8 Mar. 1943. Cf. memo for CG AAF from Col. D. R. Lyon and Col. Adrian Williamson, 27 Feb. 1943.
17. Memo for Marshall from King, 8 Feb. 1943, in Three Essays, Tab II F. Cf. reply in memo for Upston as cited in n. 13.

Memo for Sec. of Navy from King, 5 Apr. 1943.

18. See discussions in Minutes, Atlantic Convoy Conference.

19. For an account of this earlier struggle, see Vol. I of this series, chap. 15.

20. In the course of the discussions of the subcommittee of the JPS on the submarine menace, it came out that the total strength in VLR aircraft planned by Britain, Canada, and the United States exceeded the number considered necessary by 208 (260 were required, 468 planned by all agencies). (Memo for CG AAF from Cols. Lyon and Williamson, 27 Feb. 1943.)

21. Memo for CG AAF from Russell, n.d.

22. Memo for DC/S from JCNW, n.d.; ltr., CG AAFAC to CG AAF, 22 June 1943; memo for Marshall from Bowles, 3 Mar. 1943, prefaced to Bowles Rpt.; ltr., Lt. Col. Jack Roberts to AVM Lloyd, AOC, NACAF, 6 Apr. 1943; ltr., CG AAFAC to CG AAF, 6 Jan. 1943; paper, AAFAC Liaison Office, Proposed Reorganization of ASW Forces, 21 Jan. 1943.

23. Notes on CCS 54th Mtg., 31 Dec. 1942, attached to CPS 56/D. A subcommittee to study the problem was created 5 January 1943 as a result of CPS 56/D, 2 Jan. 1943. (Cf. memo for CG AAF from Cols. Lyon and Williamson, 27 Feb. 1943.)

24. Plan attached to memo for CG AAF from Cols. Lyon and Williamson, 27 Feb. 1943. Cf. paper, Proposed Reorganization of ASW Forces, 21 Jan. 1943.

25. Memo for DC/S, U.S. Army from JCNW, n.d.

26. Memo for CG AAF from Cols. Lyon and Williamson, 27 Feb. 1943. The report is known as CPS 56/3, 1 Mar. 1943. (Cf. minority report submitted by Col. Williamson, CPS 56/3, Annex B to App. C.)

27. CCS 203, 24 Apr. 1943; Notes on JCS 76th Mtg., 27 Apr. 1943 and on CCS 82d Mtg., 30 Apr. 1943. Cf. Minutes, Atlantic Convoy Conference, pp. 3, 11.

28. Ltr., President to C/S, U.S. Army and COMINCH, 18 Mar. 1943.

29. Memo for Stratemeier from Arnold, 29 Mar. 1943; R&R, comment 2, AFOCR to AFAEP, 29 Apr. 1943. Cf. CCS 189, 16 Mar. 1943; Notes on CPS 49th Mtg., attached to CPS 49/D, 20 Mar. 1943; CCS 189/2, 28 Mar. 1943; CCS 189/3, 31 Mar. 1943.

30. Memo for AC/S, OPD from AC/AS, Plans, 14 Apr. 1943.

31. See below, n. 85.

32. Hq. VIII BC, Status of CBO from U.K., Aug. 1943. By 30 June 1943 the Eighth was to have received 944 heavy bombers, but of this number only 741 were either received or under allocation.

33. Memo for AC/S, OPD from AC/AS, Plans, 14 Apr. 1943; memo for S/W from Bowles, 2 Apr. 1943.

34. Memo for Arnold from Giles, 2 Apr. 1943; ltr., Chief of Bomb. Br., AFREQ to CG AAFAC, 2 Apr. 1943; memo for S/W from Bowles, 2 Apr. 1943; memo for AC/S, OPD from AC/AS, OC&R, 12 June 1943.

35. Memo for King from Marshall, 16 Apr. 1943; JCS 268, 19 Apr. 1943.

36. For an excellent discussion of the entire antisubmarine controversy, see Henry L. Stimson and McGeorge Bundy, *On Active Service in Peace and War* (New York, 1948).

37. Bowles Rpt.

38. Memo for Marshall from S/W Stimson, 14 Mar. 1943.

39. JCS 268, 19 Apr. 1943. Cf. ltr., Stimson to Knox, 1 Apr. 1943.

40. Memo for King from Marshall, 11 May 1943.

41. JCS 263/2/D, 20 Apr. 1943.

42. Notes on JCS 75th Mtg., 20 Apr. 1943.

43. JCS 268/1, 3 May 1943.

44. Notes on JCS 77th Mtg., 4 May 1943.

45. *Ibid.*; memo for Marshall from King, 30 Apr. 1943.

46. Memo for King from Marshall, 11 May 1943. Cf. memo for C/S U.S. Army from OPD, 8 May 1943.

47. Radg. issued by COMINCH, 19 May 1943. The organization became effective 20 May 1943.

48. Status and Location of VLR A/C. Cf. AAFAC, Aircraft Action Status Rpts.

49. James Phinney Baxter, historian of OSR&D, "The Seesaw of Submarine Warfare," *Atlantic Monthly*, Aug. 1946. Cf. ONI The Conduct of the War at Sea.

50. Ltr., President to C/S, U.S. Army and COMINCH, 18 Mar. 1943; corrected draft of memo for the President from C/S and COMINCH, n.d. but prob. 19 Mar. 1943; memo for AC/S, OPD from AC/AS, A-3, 20 Mar. 1943; ltr., Air Member, Canadian Joint Staff to Arnold, 5 Jan. 1943;



R&R, comment No. 1, AFRDB to AC/AS, A-3, 12 Jan. 1943; ltr., Maj. J. P. Healy, Liaison Officer to RCAF to CG EDC, 22 Jan. 1943; R&R, comment No. 3, AC/AS, MM&D to AFREQ, 30 Mar. 1943; ltr., AFREQ to CG AAFAC, 2 Apr. 1943.

51. See sources in n. 50.

52. Det., 25th Antisub. Wing, Review of Antisub. Intel., Apr. 1943; History, 479th Antisub. Group, pp. iv-v.

53. AAFAC, Monthly Intel. Rpt., Apr. 1943, pp. 4-6; North Atlantic Antisub. Intel., May 1943, p. 8.

54. Memo, Hq. AAFAC to all concerned, 25 June 1943; History, 479th Antisub. Group.

55. Baxter, "The Seesaw of Submarine Warfare," *loc. cit.*

56. Coastal Command Review (RAF), Mar. to June for running story of Coastal Command operations in the Bay; rpt. of naval attaché in London, Serial 1071, 17 Mar. 1943; CCS 189/4, 22 Apr. 1943; CPS 53d Mtg., 6 May 1943.

57. Memo for AC/S, OPD from AFAEP, 12 Apr. 1943.

58. Memo for DC/S from AC/S, OPD, 7 June 1943.

59. History, 479th Antisub. Group, p. 2.

60. Info. supplied by British Air Ministry, Air Hist. Br. (hereinafter cited as BAM [AHB]).

61. Ltr., Col. Howard Moore, CO, 479th Group to CG AAFAC, 18 July 1943.

62. AFSHO Special File 77 (msgs.).

63. Standish Rpt., Annex II; AAFRH-7, Apps. B and C; Chief of Naval Opns., German, Japanese, and Italian Submarine Losses, World War II, OPNAV-P33-100 NEW 5-46. This last source "reflects the assessments of the Chief of Naval Operations Committee on Assessment of Damage to Enemy Submarines and the British Admiralty Assessment Committee, as well as information obtained from German, Japanese, and Italian records following the cessation of hostilities."

64. Info. supplied by BAM (AHB); AAFAC, Monthly Intel. Rpt., Aug. 1943, p. 13.

65. German, Japanese, and Italian Submarine Losses.

66. ASWORG, Analysis of all Anti-Submarine Warfare Operations in the Moroccan Sea Frontier Area, 22 July 1943

(hereinafter cited as ASWORG, Analysis), in Three Essays, Tab III D; ltr. in *ibid.*, Tab III E; History, 480th Antisub. Group, pp. 35 ff.

67. See sources in n. 66.

68. History, 480th Antisub. Group, p. 23. For the administrative story of the 480th Group while in Africa, see letters of Col. Jack Roberts, *passim*.

69. ASWORG, Analysis; ltr., Dr. J. R. Pellam to ASWORG, 10 June 1943, in Three Essays, Tab III D; History, 480th Antisub. Group.

70. Roberts Ltrs., Tabs 26 and 28.

71. German, Japanese, and Italian Submarine Losses; ASWORG, Analysis; ltr., Pellam to ASWORG, 10 June 1943; History, 480th Antisub. Group; Roberts Ltrs., Tab 16. See also AAFRH-7, App. B, charts.

72. AAFRH-7, App. C; AAFAC, Monthly Intel. Rpt., Aug. 1943, pp. 31-32.

73. AAFAC, Monthly Intel. Rpt., July 1943, pp. 5-6.

74. ASWORG, Analysis; AAFAC, Monthly Intel. Rpt., July 1943, p. 49.

75. For running account of these operations and for operational statistics, see AAFAC, Monthly Intel. Rpts., *passim*.

76. Notes on CCS 93d Mtg., 22 May 1943 (ref. CCS 241/1).

77. History, 15th Antisub. Sq., p. 10.

78. See AAFRH-7, chap. iv for discussion of training and research activities.

79. *Ibid.*

80. Memo for CG AAF from Brig. Gen. B. W. Chidlaw, 13 June 1943.

81. JCS 268/1, 3 May 1943.

82. Memo for King from Marshall, 28 June 1943.

83. Notes on JCS 79th Mtg., 10 May 1943; Minutes, Atlantic Convoy Conf.; ltr., Allied Antisub. Survey Board to COMINCH, 29 Apr. 1943; JCS 88th Mtg., 22 May 1943 (ref. CCS 241); CCS 93d Mtg., 22 May 1943 (ref. CCS 241/1); memo for Marshall from Stimson, 14 Mar. 1943; Notes on CCS 98th Mtg., 14 June 1943 (ref. CCS 241/5).

84. Memo for Col. W. C. Sweeney, OPD from Larson, 10 June 1943.

85. Stated in JCS 263/2/D, 20 Apr. 1943.

86. Memo for King from Marshall, 11 May 1943; memo for King from Arnold, 8 May 1943.

87. Memo for King from Vice Adm. R. S. Edwards, 29 May 1943. Cf. memo for Marshall from McNarney, 7 June 1943.

88. Memo for Marshall from King, 5 June 1943.

89. Memo for C/S from McNarney, 7 June 1943.

90. Notes for conf. with King by C/S, 8 June 1943.

91. Memo for DC/S from Acting AC/S, OPD, 7 June 1943, and attached draft of memo for King from DC/S; Notes on CCS 98th Mtg.; R&R, AFAEP to CG AAF, 12 June 1943; memo "for discussion with Gen. Arnold," by Lt. Col. P. C. Crowen.

92. Memo for CG AAF from AC/S, OPD, 10 July 1943, in Dissolution of the Antisubmarine Command, Annex A-2.

93. Memo for Marshall from King, 14 June 1943.

94. Memo for Marshall from King, 19 June 1943; ltr., Stimson to McNarney, 25 June 1943.

95. Ltr., Stimson to McNarney, 25 June 1943.

96. Memo for King from Marshall, 28 June 1943.

97. See Dissolution for details.

98. CM-IN-16718, Stimson for Marshall, signed Devers, W-2299, 23 July 1943; CM-IN-5719, COMINCH to Admiralty, 0 72210Z NCR 14911-S, 8 Aug. 1943.

99. Memo for Col. Gross from Lt. Col. Reynolds, AFRDB; History, 479th Antisub. Group; History, 480th Antisub. Group.

100. Dissolution, Annex A-13.

101. Memo for all AC/AS from AFREQ, 27 Oct. 1943.

102. Papers filed for October 1943 in AAG 384.7-B; Dissolution, pp. 19 ff.

103. On the CVE, see Henry M. Dater, "Development of the Escort Carrier," in *Military Affairs*, XII, No. 2 (Summer 1948), 79-90.

### NOTES TO CHAPTER 13

1. For pre-Casablanca efforts to set up post-TORCH operations, see WP-III-5, Italy, in Office Services Br., AFAEP; Intel. Service, AAF, Air Offensive Against Italy, 18 Nov. 1942; JCS 154, 18 Nov. 1942; CCS 124, 19 Nov. 1942; CPS 49/1, 27 Nov. 1942;

CPS, 39th and 40th Mtgs., 30 Nov. and 3 Dec. 1942; CPS 49/2, 4 Dec. 1942; CPS 49/3, 8 Dec. 1942; CCS 124/1, 30 Dec. 1942; CCS, 54th Mtg., 31 Dec. 1942. For the decisions made at the Casablanca conference see Gen. D. D. Eisenhower, Report on the Sicilian Operations (cited hereinafter as Eisenhower Rpt.), and CCS 170/2, 23 Jan. 1943. The decisions were not made without argument between the Americans and the British and involved a certain amount of give and take. (See, for example, Eisenhower Rpt.; CPS, 55th-68th Mtgs., 14-22 Jan. 1943, *passim*; JCS, 50th-58th Mtgs., 13-22 Jan. 1943, *passim*; Sp. Mtgs. Between the President and the JCS, 15, 16 Jan. 1943; Casablanca Conference, ANFA Mtgs., Jan. 1943.)

2. For discussions at Casablanca on post-HUSKY operations, see CPS, 55th, 58th, 66th Mtgs., 14, 16, 22 Jan. 1943; JCS, 50th, 51st, 52d, 54th, 57th, 58th Mtgs., 13, 14, 16, 18, 21, 22 Jan. 1943; 1st and 2d Sp. Mtgs. Between the President and the JCS, 15 and 16 Jan. 1943; Casablanca Conference, ANFA Mtgs., Jan. 1943; CCS 165/2 and 170/2, 22 and 23 Jan. 1943.

3. Eisenhower Rpt. Force 141 was composed of officers from the American and British armies, navies, and air forces.

4. Eisenhower Rpt.; Francis de Guinand, *Operation Victory* (London, 1947), p. 274; msg., Algiers to WAR for CCS, 7892 (NAF 182), 20 Mar. 1943; CM-IN-6513, Algiers to WAR for CCS from Eisenhower, NAF 207, 11 Apr. 1943.

5. Eisenhower Rpt.; CM-IN-2316, Algiers to WAR, 4 May 1943.

6. See CM-IN-11505, Algiers to WAR, 18 May 1943.

7. For details of these early operations beyond the littoral of North Africa, see Eisenhower to C's-in-C ME, AIR 16, 24 Nov. 1943; AIR 91, 98, and 100-102, 9, 15, and 18-20 Feb. 1943; CM-IN-2240, Cairo to AGWAR, AMSME 1980, 5 Dec. 1942; histories, 98th and 376th Bomb. Gps.; RAF Middle East Review No. 2, Jan.-Mar. 1943; AAFRH-5, Air Phase of the North African Invasion; AAFRH-14, The Twelfth Air Force in the North African Winter Campaign.

8. Hq. NAAF Operations Bulletins 1 and 2; RAFME Review No. 3, Apr.-June 1943.

9. TWX, ETOUSA to Eisenhower, 20 Feb. 1943, which specifically suggested that consideration should be given to the possibility of capturing Pantelleria because of its value as a fighter base in the invasion of Sicily. See also cable, Eisenhower to Marshall, 17 Feb. 1943, which noted that AFHQ was studying the possibility of an assault on Pantelleria.

10. Pantelleria Island Landing Beaches, prepared by the Beach Erosion Board, Corps of Engineers, U.S. Army, April 1943; *Journal of Geology*, XXI, 1913, 654; Terrain Intelligence, Pantelleria Island, prepared by the U.S. Geological Survey, Feb. 1943 (Special Report, Strategic Engineering Study No. 56). In the preparation of this section the writer found most useful AAF Historical Study No. 52, The Reduction of Pantelleria and Adjacent Islands, a monograph prepared by Dr. Edith C. Rodgers of the Air Historical Group. Useful, too, were the writer's own observations while on Pantelleria, September 1944.

11. See n. 10, above.

12. Pantelleria Operations, a dispatch by Gen. D. D. Eisenhower, June 1943 (cited hereinafter as Eisenhower, Pantelleria rpt.); Strategic Engineering Study 56; *The Times* (London), 12 June 1943; *New York Times*, 13 June 1943; G-2, AFHQ, Intelligence Notes—Pantelleria and Lampedusa, 20 July 1943 (cited hereinafter as AFHQ, Intel. Notes, 20 July); observations of the writer.

13. Hq. NAAF, Report of Air Participation in the Pantelleria Operation, 7 Aug. 1943, App. I; Eisenhower, Pantelleria rpt.; *New York Times*, 6 June 1943.

14. *Ibid.*; Hq. Pantelleria rpt.

15. *Ibid.*; Hq. Force 141, Operation Husky, 9 May 1943, in files of British Air Ministry, Air Historical Branch (cited hereinafter as BAM [AHB]). Attention is invited to an Anglo-American agreement which permits information from certain classified documents of one nation to be incorporated into the text of publications of the other nation but which forbids citation of the specific document in footnotes. Because of this agreement, the writer has been unable to cite specifically certain documents which he was permitted to examine in the files of the British Air Ministry, Air Historical Branch, and

from which certain material appearing in the text was obtained.

16. Hq. Force 141, Outline Signal Plan for the Occupation of Pantelleria and Lampedusa, and Appreciation of the Signal Problems Involved in the Seizure and Occupation of Pantelleria and Lampedusa, in BAM (AHB); RAF Mediterranean Review No. 6, pp. 57-59.

17. Eisenhower, Pantelleria rpt.; testimony of Gen. Eisenhower before the Committee on Armed Forces of the U.S. Senate, 25 Mar. 1947; CM-IN-7151, Algiers to War, 11 May 1943; memo for CG NAAF from Brig. Gen. H. R. Craig, 14 May 1943, msg., Freedom sgd. Eisenhower to ME, 11 May 1943, and Hq. Force 141, Operation Husky, 9 May 1943, last three in BAM (AHB).

18. NATAF, Participation in the Capture of Pantelleria and Lampedusa, p. 95; Eisenhower, Pantelleria rpt.; memo for CG NAAF from Craig, 14 May 1943, in BAM (AHB).

19. See n. 18, above.

20. Hq. AAFSC/MTO, Air Service Command on the Island of Pantelleria.

21. History, 12th AF, Vol. III, The Twelfth Air Force in the Sicilian Campaign; NATAF, Participation in the Capture of Pantelleria; draft history, 12th AF, Pt. I, chap. xii; Opnl. Analysis Sec., Hq. NAAF, Pantelleria, 30 May through 11 June, in History, 12th AF, Vol. III, Annex 3.

22. See n. 21, above.

23. Figures on strength of the German and Italian air forces supplied by the British Air Ministry, Air Historical Branch, through the courtesy of Mr. J. C. Nerney and S/Ldr. L. A. Jackets

24. CM-IN-5757 and 6087, Algiers to AGWAR, 9 May 1943; CM-IN-5895, Spaatz to Arnold thru Algiers to AGWAR, 9 May 1943; CM-IN-1214, 6844, 6856, Algiers to AGWAR, 2, 10, 11 May 1943; 12th AF Intel. Sums., May and June 1943; RAFME Review No. 3, pp. 41, 42. The first heavy bombing of the island was on 8 May when P-38's hit Marghana airfield with 1,000-pound bombs. (See Mediterranean Air Command, Operational Record Book [cited hereinafter as MAC, ORB], App. 52, in BAM [AHB]. For the order to blockade Pantelleria, see

msg., MAC to NAAF [Adv.], A833, 14 May 1943, in BAM [AHB].)

25. Eisenhower, Pantelleria rpt.; NATAF Opn. Instruction 98, in Participation in the Capture of Pantelleria, Annex A; Hq. XII Air Support Comd., Pantellerian Campaign (14 May-12 June 1943); RAFME Review No. 3. In the first attack of the period, on 18 May, B-25's and B-26's dropped 97 tons on Porto di Pantelleria. (See MAC, ORB, App. 52.)

26. Hq. XII BC, War Diary of Maj. B. E. Clark, 1 Jan.-1 Oct. 1943; NAAF Opnl. and Intel. Sums., May 1943; NAAF Opns. Bulletin 3; Participation in the Capture of Pantelleria; 33d Fighter Group in the Pantellerian Campaign, in History, 12th AF, Vol. III, Annex 4; RAF Med. Review No. 6; RAFME Review No. 3; Hq. XII ASC, Pantellerian Campaign; Hq. NACAF, Their Victory; CM-IN-628, AFHQ North Africa to WAR, 1 June 1943; Hq. NAAF, Detailed Interpretation Rpt. D-44, 26 May 1943; draft history, 12th AF, Pt. I, chap. xii; MAC, ORB, App. 52; AFHQ, Intel. Notes, 20 July.

27. Draft history, 12th AF, Pt. I, chap. xii.

28. RAFME Review No. 3; Eisenhower, Pantelleria rpt.; Hq. XII ASC, Pantellerian Campaign; S. Zuckerman, Operation CORKSCREW—Analysis of Relation Between Bomber Effort and Effects Achieved (hereinafter cited as Zuckerman Rpt.).

29. NAAF Opns. Bulletin 3, pp. 18-23; RAFME Review No. 3; XII ASC, Pantellerian Campaign; The Twelfth Air Force in the Sicilian Campaign; Opnl. Analysis Sec., Hq. NAAF, Pantelleria, 30 May thru 11 June 1943; History, 2d Bomb. Gp., 24 Sept. 1942-31 Oct. 1943; CM-IN-7452, 12th AF to AGWAR, 11 June 1943; CM-IN-7459, Eisenhower to WAR, 11 June 1943; Participation in the Capture of Pantelleria; ONI Weekly, 16 June 1943, pp. 1699-1700; Impact, I, No. 4 (July 1943), pp. 1-3; NAAF Opns. Order 9, 31 May 1943; additional data from files of BAM (AHB).

30. CM-IN-3793, Algiers to WAR, 6 June 1943; CM-IN-3928, Eisenhower to WAR, 6 June 1943; NAAF Weekly Air Intel. Sum. 30; Participation in the Capture of Pantelleria; Pantellerian Campaign;

CM-IN-7919, AFHQ, North Africa to AGWAR, 12 June 1943; Twelfth Air Force in the Sicilian Campaign; CM-IN-7509, 12th AF to WAR, 12 June 1943. The Italians claimed the destruction of 188 Allied planes over Pantelleria between 12 May and 11 June. (See Select Documents on Air Operations 1940-1943, from Italian Air Ministry archives in Rome, Sec. 1, Appreciation 6, translated and made available to the writer by Mr. W. M. Gould, BAM [AHB].)

31. CM-IN-417, Algiers to WAR, 1 June 1943; CM-IN-561, AFHQ, Algiers to WAR, 1 June 1943; CM-IN-3352, AFHQ, North Africa to WAR, 4 June 1943; Eisenhower, Pantelleria rpt.; CM-IN-1885, Algiers to WAR, 3 June 1943; RAFME Review No. 3; CM-IN-2485, Algiers to WAR, 4 June 1943; CM-IN-3748, AFHQ, North Africa to AGWAR, 6 June 1943; CM-IN-6586, AFHQ, North Africa to WAR, 11 June 1943; CM-IN-4417, AFHQ, North Africa to WAR, 7 June 1943; CM-IN-7452, 12th AF to AGWAR, 11 June 1943. Post-occupation examination of the batteries showed that the Navy's shelling slightly damaged two batteries. (See Zuckerman Rpt., App. XXI, and AFHQ, Intel. Notes, 20 July.)

32. Eisenhower, Pantelleria rpt.; 33d Fighter Group in the Pantellerian Campaign, in History, 12th AF, Vol. III; CM-IN-7452, 12th AF to AGWAR, 11 June 1943; msg., Norstad to Spaatz, 8 June 1943.

33. CM-IN-9611, Algiers to WAR, 15 June 1943; Brit. Ministry of Information, 12 June 1943; Eisenhower, Pantelleria rpt.; NATAF Opn. Instruction 105.

34. Brit. Ministry of Information, 13 June 1943; NATAF Opn. Instruction 98, App. B, 30 May 1943; Pantellerian Campaign; CM-IN-7963, Spaatz to Arnold thru 12th AF to WAR, 12 June 1943; Eisenhower, Pantelleria rpt.; Hq. Combined Training Center (Lt. Col. K. A. Wagg) to Commandant CTC (NA), 17 June 1943 (cited hereinafter as Wagg Rpt.).

35. Eisenhower, Pantelleria rpt.; CM-IN-9611, Algiers to WAR, 15 June 1943; CM-IN-1546 and 1218, Algiers to WAR, 11 June 1943; SITREP, Freedom to USFOR *et al.*, 11 June 1943, in BAM (AHB); *The Times* (London), 15 July

1943; Wagg Rpt.; Force 343, Report on Operation Corkscrew, 18 June 1943, in BAM (AHB); File 77 (reports); additional data from BAM (AHB).

36. *The Times* (London), 15 June 1943, quoting its correspondent whose information came from General Maffei at the signing of the armistice. See also, Air Ministry Weekly Intel. Sum. 201, 10 July 1943.

37. Eisenhower, Pantelleria rpt.; Air Ministry Weekly Intel. Sum. 201, 10 July 1943; CM-IN-6690, AFHQ to USFOR, 11 June 1943; draft of msg., Norstad to Spaatz, 1402 hrs., 11 June 1943; CM-IN-7371, Algiers to WAR, 11 June 1943; Maj. Gen. W. B. Smith to Gen. Eisenhower, Lessons from Operations Against Pantelleria, 12 July 1943.

38. G-2, AFHQ, Intel. Notes—Pantelleria and Lampedusa, 3 July 1943, in BAM (AHB).

39. Eisenhower, Pantelleria rpt.; CM-IN-7963, 12th AF to WAR, 12 June 1943; CM-IN-12947, NAAF to WAR, 13 June 1943; ONI Weekly Nos. 24 and 34, 16 June and 25 Aug. 1943; NAAF Opnl. and Intel. Sums. 112 and 113; CM-IN-7726, Algiers to WAR, 12 June 1943; Air Ministry Weekly Intel. Sum. 206; CM-IN-7726 and 8539, Spaatz to Arnold thru Algiers to WAR, 12 and 13 June 1943; CM-IN-8440, Algiers to WAR, 13 June 1943; AFHQ, Intel. Notes, 20 July; G-2, AFHQ, Additional Notes on the Defenses of Lampedusa, 20 July 1943; Hq. Force 141, Operation Husky, in BAM (AHB); 27th Bomb. Gp., Pantelleria and Lampedusa Campaigns, 6 to 12 June 1943; CM-IN-7850 and 14577, AFHQ, North Africa to WAR, 13 and 22 June 1943; CM-IN-13602, Algiers to WAR, 21 June 1943; Impact, I, No. 5 (Aug. 1943), pp. 40-43; draft history, 12th AF, Pt. I, chap. xii; CM-IN-7584, Algiers to WAR, 12 June 1943. For the story of the RAF sergeant pilot, see message, NATAF to AOC-in-C, MAC, 12 Aug. 1943, in MAC, ORB, App. 55, and other documents in BAM (AHB), 14 June 1943. The sergeant, who landed in the midst of heavy air bombardment, repaired his motor and promptly took off for Sousse.

40. ONI Weekly No. 24, 16 June 1943; CM-IN-8786, 8975, 9588, 12801, AFHQ, North Africa to WAR, 14, 15, 16, 21 June 1943.

41. CM-IN-10303 and 10712, Algiers to WAR, 16 June 1943; CM-IN-13602, Algiers to WAR, 21 June 1943; Eisenhower, Pantelleria rpt.; Hq. AAFSC/MTO, AAFSC on the Island of Pantelleria; Twelfth Air Force in the Sicilian Campaign; additional info. from BAM (AHB).

42. See sources in n. 41.

43. RAFME Review No. 2, pp. 107, 118, 121, 122; MC-IN-8918, CAF Lampedusa to Hq. NACAF *et al.*, 20 June 1943, in BAM (AHB).

44. *Newsweek*, XXI, No. 25 (21 June 1943); *New York Times*, 12 June 1943; *The Times* (London), 16 June 1943; Air Ministry Weekly Intel. Sum. 202, 17 July 1943; CM-IN-10362 and 10446, Algiers to WAR, 16 June 1943; memo for C-in-C from Maj. Gen. W. B. Smith, 12 July 1943; AFHQ, Intel. Notes, 20 July; additional info. from files of BAM (AHB).

45. Memo for C-in-C from Maj. Gen. W. B. Smith, 12 July 1943; CM-IN-7612, Algiers to War, 12 June 1943; AAF Evaluation Rpt., MTO, VII, Pt. A, 1 Dec. 1944; CM-IN-10237, Spaatz to AGWAR for CG AAF, attn. AFABI, 16 June 1943; Hq. NAAF, Report of Air Participation in the Pantelleria Operation; Report by Brigadier A. D. Campbell on a Visit to Pantelleria, 18/19 June 1943; Force 343, Report on Operation Corkscrew, 18 June 1943, in BAM (AHB); observations of the writer; additional info. from BAM (AHB).

46. Zuckerman Rpt.; AAF Evaluation Board Rpt.; Hq. AAFSC/MTO, AAFSC on the Island of Pantelleria; NAAF Weekly Air Intel. Sum. 31; ONI Weekly, III, No. 12 (22 Mar. 1944); memo for C-in-C from Maj. Gen. W. B. Smith, 12 July 1943. Hq. MAAF, Operation CORKSCREW photographs, in AG WD Records Br., has excellent pictures of the batteries after the bombing.

47. Zuckerman Rpt.; Air Ministry Weekly Intel. Sum. 202, 17 July 1943; AFHQ, Intel. Notes, 20 July; MC-IN-6468, 1 Main Div. 048 to AFHQ, 15 June 1943; Eisenhower, Pantelleria rpt.; Force 343, Report on Operation Corkscrew, 18 June 1943; additional info. from BAM (AHB).

48. Memo for C-in-C from Maj. Gen. W. B. Smith, 12 July 1943; Air Sec., HMS *Largs*, Operation Corkscrew, 18 June 1943, in BAM (AHB); NATAF, Participation

in the Capture of Pantelleria; Zuckerman Rpt.; NAAF, Pantelleria, 30 May thru 11 June 1943; draft history, 12th AF, Pt. I, chap. xii; File 77 (reports); 14 Oct. 1943; AFHQ, Intel. Notes, 20 July; MAAF, Operation CORKSCREW photographs; Force 141, Lessons from Pantelleria, in BAM (AHB); additional info. from BAM (AHB).

49. Zuckerman Rpt.; NAAF, Pantelleria; NATAF, Participation in the Capture of Pantelleria; memo for C-in-C Allied Forces from Spaatz, 7 Aug. 1943.

50. Plan for Employment of the North-west African Air Forces and Attached Air Forces in Operation HUSKY; memo for C/S 9th AF from Maj. Gen. L. H. Brereton, 17 May 1943, in A-3 HUSKY, 9th AF (68-A).

51. RAFME Review No. 3.

52. NAAF Weekly Intel. Sums., June 1943; An Appreciation of the Effect of Allied Air Force Attacks on Axis Airfields in Sardinia, Sicily, and Italy, issued by BJSM, in A-2 Library; CM-IN-8688, 14 June 1943; RAFME Review No. 3; report by Maj. Gen. Lewis H. Brereton, Employment of Heavy Bombardment Against Enemy Airdromes, 3 Aug. 1943, in 9th AF Evaluations; CM-IN-11411, 18 June 1943; Air Ministry Weekly Intel. Sum. 213, 2 Oct. 1943; CM-IN-17804, 28 June 1943; NASAF, Participation in the Sicilian Campaign; CM-IN-12801, 21 June 1943; NAAF Opnl. and Intel. Sum. 124.

53. Twelfth Air Force in the Sicilian Campaign; RAFME Review No. 3; NASAF's Participation in the Sicilian Campaign; NAAF Opnl. and Intel. Sums. 118-32; 12th AF Weekly Intel. Sum. 34; CM-IN-12518, 20 June 1943; NAAF Weekly Intel. Sums. 31-33; Air Hq. Malta, Preliminary Report on HUSKY Operations by Malta-based Aircraft.

54. Ltr., Spaatz to Arnold, 14 July 1943.

55. RAFME Review No. 3; Adv. Hq. DAF, Report on the Planning and Execution of Operation HUSKY; Preliminary Report on HUSKY Operations by Malta-based Aircraft. The Gozo strip was built by American engineers in twenty days.

56. Air Ministry, Air Attacks on Airfields, Sept. 1943; Brereton, Employment of Heavy Bombardment Against Enemy Airdromes; RAF, Malta Monthly Intel. Sum., July 1943, in files of BAM (AHB).

57. Brereton, Employment of Heavy Bombardment Against Enemy Airdromes.

58. Plan for the Employment of NAAF; Eisenhower Rpt.; NASAF's Participation in the Sicilian Campaign; Employment of the Tactical Air Force Units Located in Tunisia for Operation HUSKY, 29 June 1943; NATAF Opn. Instruction 4, App. F: Report on the NATAF in the Capture of Sicily, p. 5; RAFME Weekly Intel. Sum. 34; 9th AF, A-2 Periodic Rpt. 39; Air Ministry, Air Attacks on Airfields, Sept. 1943; Ltr., Spaatz to Arnold, 14 July 1943.

59. NAAF, A-3 Opnl. Research Rpt. 1; CM-IN-3929 and 4648, Cairo to AGWAR, 6 and 7 July 1943; 9th AF, A-2 Periodic Rpt. 39; RAF, Malta Monthly Intel. Sum., July 1943; RAFME Weekly Intel. Sum., 160; RAF Signals in the War, 1939-1945, Vol. IV (draft), in files of BAM (AHB); An Appreciation of the Effect of Allied Air Force Attacks on Axis Airfields in Sardinia, Sicily, and Italy.

60. NAAF Weekly Intel. Sum. 34; Twelfth Air Force in the Sicilian Campaign.

61. Plan for the Employment of NAAF; Preliminary Report on HUSKY Operations by Malta-based Aircraft; History, 12th Photo Reconnaissance Sq.; interview with Col. Elliott Roosevelt, CO NAPRW, 30 July 1943, in Bureau of Aeronautics, U.S. Navy.

62. Hq. NACAF, Their Victory, a Six Months' History of NACAF; Hq. MACAF, A Review of MACAF Operations, Mar. 1943-Sept. 1944, dtd. 14 Sept. 1944; History, 414th Fighter Sq.; NAAF Opnl. and Intel. Sum. 140; NACAF Weekly Intel. and Opnl. Statistical Record 9; "The Work of MACAF," in RAF Med. Review No. 6.

63. Eisenhower Rpt.; History of the Seventh Army in the Sicilian Campaign; Force 141 Opn. Instruction 2, 28 May 1943, Amend. 1.

64. S/Ldr. J. N. White, Evolution of Air Command in the Mediterranean; MAC Operations Record Book, Apps. 1-12 (HUSKY) and App. K; Tactical Appreciation, in A-3 HUSKY, 9th AF; Plan for the Employment of the NAAF and Attached Air Forces in Operation HUSKY.

65. Report on Operations by NATAF in the Sicilian Campaign, p. 3; Hq.



AAFSC/MTO, History of the Original XII AFSC; History of Avn. Engineers in MTO.

66. Eisenhower Rpt.; draft history, 12th AF, Pt. I, chap. xiii; Plan for the Employment of the NAAF and Attached Air Forces in Operation HUSKY.

67. Air Administrative Plan for HUSKY; History of the Original XII AFSC; Hq. AAFSC/MTO, Aircraft and Glider Assembly in the MTO; History of Avn. Engineers in MTO.

68. Eisenhower Rpt.

69. Available figures on the number of Allied and enemy aircraft vary so greatly that no single set can be taken as authoritative. (But see especially, MAC Operations Record Book, App. 61, in files of BAM [AHB], and statistics prepared for the author by Statistical Control, Hq. USAF.) The USAAF was using 14 different types of aircraft, the RAF 24 types, and the FAF 2 types. Many of these, of course, were "duplicates"; for example, both the USAAF and the RAF used Spitfires. (See files of BAM [AHB].)

#### NOTES TO CHAPTER 14

1. Gen D. D. Eisenhower, Report on the Sicilian Operations (hereinafter cited as Eisenhower Rpt.); Hq. NAAFTCC, Report of Operations and Activities Including the Sicilian Campaign, 18 May-31 June 1943; interview with Brig. Gen. Ray A. Dunn, 14 Oct. 1943; Report on Airborne Operations-Sicily, July 1943, and msg., MAC to Air Ministry, 28 July 1943, in BAM (AHB). In preparing the story of the USAAF in the Sicilian campaign the writer has made extensive use of AAF Historical Study No. 37, Participation of the Ninth and Twelfth Air Forces in the Sicilian Campaign, a monograph written by Mr. Harry L. Coles.

2. Eisenhower Rpt.; NAAFTCC, Report of Operations and Activities Including the Sicilian Campaign; memo for Chief, Unit Training Div. from Lt. Col. F. K. MacMahon, Chief, Troop Carrier Br., Conference with Maj. Gen. Swing, CG 11th AB Div., 30 July 1943; Report on Detachment of Group Capt. T. B. Cooper to North Africa, June-July 1943; memo for Gen. Arnold from Maj. Gen. Clayton Bissell, AC/AS, Intel., Report of Allied

Force Airborne Board, 5 Nov. 1943; memo for C-in-C AFHQ from Brig. Gen. P. L. Williams, 13 July 1943; Military Reports of the United Nations, No. 11, 15 Oct. 1943; F/Lt. D. A. Grant, Operational Attachment to No. 295 Squadron, 8th June to 6th Aug. 1943, in Special Reports, MED/ME, Vol. I, Sec. 2; Dunn interview; Col. W. S. Stone to CG AAF, attn. AC/AS, OC&R, Weather Div., Amendment to Report of Operations and Activities Including the Sicilian Campaign; Francis de Guingand, *Operation Victory*, p. 290; Proceedings of Board of Officers Considering Airborne Operations (AFHQ), 23 July 1943, and attached memo from Maj. Gen. F. A. M. Browning, Report on Airborne Operations. According to Troop Carrier, the wind velocity (25 to 30 m.p.h.) was twice that of the actual forecast, but according to the AAF Weather Wing the velocity was forecast exactly. (See ltr., Hq. Weather Wing to CG AAF, 27 Mar. 1944; statement, Capt. W. E. Dickey, staff weather officer, 64th TCG, 29 Jan. 1944; ltr., Col. Peter S. Rask, XII TCC [Prov.] to regional control officer, 12th Weather Region, 28 Jan. 1944.) For a full discussion of the inadequate training received by the glider pilots, see especially the report by F/Lt. D. A. Grant, Operational Attachment to No. 295 Squadron, as cited above, and Hq. 38 Gp., Despatch Review 6, Airborne Assault Operations, Feb. 1946, in files of BAM (AHB).

3. NAAFTCC, Report of Operations and Activities, Report on Airborne Operations in Husky, 15 Aug. 1943 (hereinafter cited as Billingslea Rpt.); Eisenhower Rpt.; memo for Gen. Arnold from R. C. duPont, special asst., glider program, 25 Aug. 1943; Proceedings of Board of Officers (AFHQ), 23 July 1943.

4. NAAFTCC, Report of Operations and Activities; msg., Force 141 to NAAF (Adv.), 11 June 1943; memo for 3 SAAF Wing from TBF, n.d.; memo for AOC TAF *et al.* from Norstad, 3 July 1943, in TBF Air Operations, in BAM (AHB).

5. Report of NATAF; RAF Med. Review Nos. 3, 4, 8, 9; Stat. Control and Operations Sec., Air Hq. Malta, Preliminary Report on HUSKY Operations by Malta-based Aircraft, 9-17 July 1943; Report of Western Naval Task Force; NAAF

Weekly Intel. Sums. 34 and 41, 3-9 July and 21-27 Aug. 1943; Report of NAAF on Husky; Eisenhower Rpt.

6. RAF Med. Review No. 4; CM-IN-8206, Spaatz to Arnold, 11 July 1943; NAAF Opnl. and Intel. Sums. 140 and 141; History, 27th Fighter-Bomber Gp., July 1943. On D minus 1 the Ninth Air Force complemented the Twelfth's operations with forty-six sorties by heavies against Sicilian airfields and eighteen against an enemy headquarters at Taormina. (See msg., Q107E, Q108E, and Q109E, 10 July 1943, in files of BAM [AHB].)

7. Eisenhower Rpt.; Report of the Seventh Army; ltr., Spaatz to Arnold, 14 July 1943.

8. Eisenhower Rpt.; Report of Western Naval Task Force; Report of the Seventh Army; Report of NAAF; Hq. MAAF, A-3 Monthly Opns. Bulletin 9, Dec. 1943; Hq. 64th Fighter Wing, Summary of Operations, Sicilian Campaign; Report of Malta-based Aircraft; Hq. MAC, Signals Report on Amphibious Operations in the Mediterranean from July to September 1943, 22 Oct. 1943; additional info. from BAM (AHB).

9. ONI, The Sicilian Campaign, p. 34; Report of Western Naval Task Force. Admiralty Battle Summary No. 35, The Invasion of Sicily, pp. 35-42, 53-76, 124-30; msg., War Cabinet Offices to All Sictel Addressees, 20 July 1943; Report of Western Naval Task Force; Report of NAAF; Report of Malta-based Aircraft; ltr., Spaatz to Arnold, 14 July 1943; Report of NATAF; History, 324th Fighter Gp., July 1943; Hq. 64th Fighter Wing, Summary of Opns.

10. Report of Seventh Army; Report of Western Naval Task Force; RAFME Weekly Intel. Sum. 160, 6-13 July 1943.

11. Report of NATAF; 12th AF Weekly Intel. Sum. 35, 10-16 July 1943; ltr., Spaatz to Arnold, 14 July 1943; History, 33d Fighter Gp., Vol. I; History, 31st Fighter Gp.; Hq. RAF, Malta Daily Intel. Sums. 742-830, 2 July-30 Sept. 1943, in files of BAM (AHB); NAAF Opnl. and Intel. Sums. 141-44; Hq. 64th Fighter Wing, Summary of Opns.; memo for CG Seventh Army from Col. L. P. Hickey, 18 July 1943. The enemy's air attacks were so weak that on and after D plus 1, Allied fighter patrols were reduced from twelve

to eight aircraft. (Information from BAM [AHB].)

12. Eisenhower Rpt.; Military Reports of the United Nations, No. 11; NAAFTCC Rpt. 85; memo for Chief, Unit Training Div. from Lt. Col. F. K. MacMahon, Chief, Troop Carrier Br., Conference with Maj. Gen. Swing, CG 11th AB Div., 30 July 1943; histories, 53d and 59th Troop Carrier Sqs., 316th Troop Carrier Gp.; Billingslea Rpt.; CM-OUT-1108, Marshall to Eisenhower, Freedom Algiers, 28 July 1943; CM-IN-21022, Eisenhower to Marshall, 29 July 1943; Proceedings of Board of Officers (AFHQ), 23 July 1943, with attached memo from Capt. B. P. Disque, Jr., Hq. 52d TCW, 12 July 1943; Admiralty Battle Sum. 35, The Invasion of Sicily, pp. 146-47.

13. Eisenhower Rpt.; Dunn interview; Military Reports of the United Nations, No. 11; Guingand, *Operation Victory*, p. 296; Proceedings of Board of Officers (AFHQ), 23 July 1943; memo for CG NAAFTCC from Lt. Col. O. G. Birtwistle, 14 July 1943; memo for C-in-C AFHQ from Brig. Gen. P. L. Williams, 15 July 1943; F/Lt. D. A. Grant, Operational Attachment to No. 295 Squadron; Despatch Review 6, Airborne Assault Operations, Feb. 1946; Report on Airborne Operations-Sicily. The last three documents are in the files of the British Air Ministry (AHB).

14. NAAFTCC Rpts. 88 and 89; msg., NAAFTCC to CG AFHQ *et al.*, 15 July 1943.

15. CM-IN-21022, Algiers to WAR, 29 July 1943; NAAFTCC Rpts. 88, 89, 104; Eisenhower Rpt.; Report on Airborne Operations-Sicily; additional info. from BAM (AHB).

16. Ltr., Spaatz to Arnold, 14 July 1943; ltr., Eisenhower to Marshall, 17 July 1943; memo for Maj. Gen. T. T. Handy from Brig. Gen. J. E. Upston, 21 July 1943; memo for Gen. Arnold from R. C. duPont, 25 Aug. 1943; Report on Airborne Operations-Sicily; msg., MAC to Air Ministry, A825, 28 July 1943; CM-IN-21022, Algiers to WAR, 29 July 1943; additional info. from BAM (AHB).

17. Eisenhower Rpt.; AFHQ Training Memo 43, 2 Aug. 1943, in Air Force Board Report. See also memo for Gen. Vandenberg from R. C. duPont, 30 Aug.

1943. Numerous offices and officers, both air and ground, passed judgment on the airborne operations and suggested ways by which they might be more effective and losses be reduced in the future. Among the better were: msg., War Cabinet Offices to All Sictel Addressees, 20 July 1943; Joint War Office/Air Ministry Report on the Employment of Airborne Forces; Report on Detachment of Group Capt. T. B. Cooper to North Africa, June-July 1943; F/Lt. D. A. Grant, Operational Attachment to No. 205 Squadron, in files of BAM (AHB); C.S. 20166, Dir. of Opns., 7 Oct. 1943, in files of BAM (AHB); other data from files of BAM (AHB).

18. Report of NAAF; Report of NATAF; History, 33d Fighter Gp., Vol. I; NAAF Opnl. and Intel. Sums. 145 and 146; msg., War Cabinet Offices to All Sictel Addressees, 20 July 1943; Hq. MAC, Signals Report on Amphibious Operations. The GAF losses were so severe that on the 12th the enemy brought some Ju-87's out of retirement only to lose an entire flight to Malta-based Spitfires. (See The Rise and Fall of the German Air Force, Pt. 3, chap. 11, D of I [O], in BAM [AHB].)

19. 12th AF Weekly Intel. Sum. 35; NASAF, Participation in the Sicilian Campaign from 15 June through 25 July 1943; NAAF Opnl. and Intel. Sums. 140-43; 9th AF A-2 Periodic Rpt. 40; RAFME Weekly Intel. Sum. 160; AFSHO Special File 77.

20. Report of NAAF; histories, 31st and 33d Fighter Gps.

21. Report of Malta-based Aircraft; Report of NAAF; Hq. 64th Fighter Wing, Summary of Operations; histories of various USAAF fighter units; Report, Technical Observer (Col. G. W. Nolan) to CG NAAF, 24 Sept. 1943, in BAM (AHB). The only airfield in southern Sicily fully destroyed by the Germans was Pachino. The British repaired it in forty-eight hours. (See C.O.H.Q. Bulletin R/1, Notes on Airfield Construction in Sicily and Southern Italy, 27 Nov. 1943, in BAM [AHB].)

22. Report of Seventh Army; Report of NAAF; NAAF Opnl. and Intel. Sums. 144-47; NACAF Weekly Intel. Sum. 10; RAF Med. Review No. 4; 12th AF Weekly Intel. Sum. 35; 9th AF A-2 Periodic Rpt. 40; Adv. Hq. DAF, Report on Lessons

Learnt from Operation Husky, App. C, 15 Aug. 1943, in files of BAM (AHB).

23. Report of Seventh Army; NATAF Opn. Instruction 15, 21 July 1943.

24. NAAF Opnl. and Intel. Sums. 148-51; RAF Med. Review No. 4 (July-Sept. 1943), p. 26.

25. Report of Seventh Army.

26. NAAF Opnl. and Intel. Sums. 147-62; RAFME Weekly Intel. Sum. 162; AFHQ, G-2 Weekly Intel. Sum. 48; RAF Med. Review No. 4; NAAF Weekly Intel. Sum. 36.

27. NAAF Weekly Intel. Sum. 36; CM-IN-2592 (4-8-43), Eisenhower to Marshall, 4 Aug. 1943; ltr., Eisenhower to Marshall, 17 July 1943; additional info. from BAM (AHB).

28. Memo for AC/AS-2 from Hq. NAAF, A-2 Sec., Preliminary Analysis of Strategic Targets in Italy and Sicily, 3 May 1943; NASAF's Participation in the Sicilian Campaign; 9th AF A-2 Periodic Report 41, 27 July 1943; RAF Med. Review No. 4, p. 24; RAFME Weekly Intel. Sum. 161; Report of NAAF, p. 10.

29. Air Ministry Weekly Intel. Sum. 204, 31 July 1943; CM-IN-5722, Algiers to WAR, 8 July 1943; CM-OUT-8201, CCS to CG Freedom Algiers, 19 June 1943; CM-OUT-10814, CCS to Eisenhower, 25 June 1943; MC-IN-6633, AGWAR from CCS to Eisenhower, 16 June 1943; CM-IN-12771, Eisenhower to WAR, NAF 292, 18 July 1943; Hq. NAAF, A-3 Sec. Opns. Bulletin 5, 1-31 Aug. 1943; JICA AFHQ Detailed Interp. Rpt. D-73, 7 Sept. 1943; NASAF's Participation in the Sicilian Campaign; ltrs., Lt. Gen. Carl Spaatz to Gen. H. H. Arnold, 27 and 30 July 1943; CM-OUT-13091, Algiers to WAR, 18 July 1943; CM-IN-10360, Eisenhower to AGWAR for CCS, 15 July 1943; CM-OUT-6169, Algiers for USFOR, 15 June 1943; CM-IN-14181, Adv. AFHQ to WAR, 20 July 1943.

30. NASAF's Participation in the Sicilian Campaign; NAAF Opnl. and Intel. Sums. 148-53; NAAF Weekly Intel. Sum. 37; RAFME Weekly Intel. Sum. 161; RAF Med. Review No. 4, p. 30.

31. Report of Seventh Army.

32. NAAF Monthly Opns. Bulletin 9; Report of NAAF, p. 13; NAAF Opnl. and Intel. Sums. 157-62; ltr., Spaatz to

Arnold, 30 July 1943; Hq. 64th Fighter Wing, Sum. of Opns.

33. Edgar McInnis, *The War: Fourth Year*, p. 322.

34. Report of Seventh Army; AFHQ, G-2 Weekly Intel. Sum. 50. The ground situation for the period 2-8 August is well summarized in CM-IN-2931, 3218, 3428, 4290, Algiers to WAR, 4, 5, 5, 6 Aug., and CM-IN-5716, AFHQ to WAR, 8 Aug. 1943.

35. Report of NAAF, p. 15.

36. RAF Med. Review No. 4; History, 340th Bomb. Gp. (M), 1 Apr. to 1 Oct. 1943; NAAF Opnl. and Intel. Sums. 162-68; CM-IN-3428, Algiers to WAR, 5 Aug. 1943.

37. Report of Seventh Army; NAAF Opnl. and Intel. Sum. 167; war diary, 527th Fighter-Bomber Sq. (86th F-B Gp.), Aug. 1943; memo for C-in-C from Maj. Gen. J. P. Lucas, 26 Aug. 1943.

38. Report of NAAF, p. 16; History, 340th Bomb. Gp.; Guingand, *Operation Victory*, p. 309.

39. RAF Med. Review No. 4; Report of NAAF, p. 19; Report of Seventh Army; NAAF Opnl. and Intel. Sums. 169-75; ltr., Spaatz to Arnold, 30 July 1943.

40. AFHQ, G-2 Weekly Intel. Sum. 51; RAFME Weekly Intel. Sum. 165.

41. NAAF Opnl. and Intel. Sums. 169, 172-73; Report of Seventh Army; ltr., Col. Paul Harkins to Brig. Gen. R. W. Harper, incl. to memo for CG ASCPFO, from Gen. Harper, 13 Oct. 1943.

42. Report of Seventh Army.

43. RAF Med. Review No. 4; RAFME Weekly Intel. Sum. 165; extracts of reports from Fuehrer conference of 26 July 1943, translated by BAM (AHB), 18 Oct. 1943.

44. RAF Med. Review No. 4; RAFME Weekly Intel. Sums. 171-75; Report of NAAF, p. 19; NAAF Opnl. and Intel. Sums. 155-79; CM-IN-8830, Algiers to WAR, 12 Aug. 1943.

45. NAAF Weekly Intel. Sum. 40; NATAF report; Operations of British, Indian, and Dominion Forces in Italy, Pt. 1, Sec. F, in BAM (AHB).

46. Ltr., Spaatz to Arnold, 30 Aug. 1943; CM-IN-2592, Algiers to WAR, 4 Aug. 1943; CM-IN-8830, Algiers to WAR, 12 Aug. 1943.

47. NAAF Opnl. and Intel. Sums. 154-

78; RAFME Weekly Intel. Sums. 162-63; NASAF's Participation in the Italian Campaign; NAAF Weekly Intel. Sums. 38-39; RAF Med. Review No. 4; CM-OUT-464 (8-2-43), CCS to Eisenhower; CM-OUT-675 (8-3-43), 2 Aug. 1943; CM-IN-1637 (8-3-43) and CM-IN-2592 (8-4-43), Eisenhower to Marshall, 3 and 4 Aug. 1943. An attack on Rome to be delivered on 3 August was canceled when the theater received from Washington a garbled signal referring to negotiations to make Rome an open city. (Information from BAM [AHB].)

48. NAAF Opnl. and Intel. Sums. 165, 169, 177-78; NAAF Weekly Intel. Sum. 39.

49. NAAF Opnl. and Intel. Sums. 157-60, 173, 178; NAAF Weekly Intel. Sum. 37; RAFME Weekly Intel. Sums. 164-65; memo for C/S MAC from Capt. J. J. Jacobbi, Hq. MAC, 24 Oct. 1943, and accompanying charts; Hq. MAAF, Bombing Survey Unit Report 5.

50. RAF Med. Review No. 4, pp. 73-76; NAAF Opnl. and Intel. Sums. 152, 156, 163-68; History, 317th Fighter Sq.; NASAF Intops Sums. 18-27; RAFME Weekly Intel. Sum. 165; NAAF Weekly Intel. Sum. 40.

51. NAAF Weekly Intel. Sum. 40; RAFME Weekly Intel. Sum. 165; RAF Med. Review No. 4.

52. NACAF Weekly Intel. Sums. 12-15; Report of NAAF, p. 19; Italian Merchant Shipping Sunk in the Mediterranean, 10 June-8 Sept. 1943, in BAM (AHB).

53. The full story of the Ploesti raid is told in AAFRH-3, The Ploesti Mission of 1 August 1943, a monograph prepared in the Air Historical Office by Capt. Earl Cruikshank.

54. OSS, Roumania, Dissemination A-12330; also, High Command, Bureau of the Services de Renseignements and Services de Sécurité Militaire, 8 Sept. 1943, in Ninth AF Evaluations (1943).

55. *New York Times*, 26-28 June, 19 July 1941, 15 Sept. 1942; paraphrase of code cablegram sgd. Ratay, Mil. Attaché, Bucharest, 1 July 1941; report of P. Lam-bright, in AFIOF Target Folder; interviews with G. Mattingly and Paul Lam-bright, 22 Jan. and 27 Apr. 1942.

56. Paraphrase of secret msg., Cairo to WD, 4 Jan. 1942, in AFIOF Target Folder,

gives earliest of the studies. For others, see AAFRH-3, pp. 12-14.

57. AAFRH-3, pp. 12-13, 20-24; CM-OUT-8584, Sec., WDGS to CG USAF, Algiers, 20 May 1943.

58. TRIDENT, 4th Mtg., 21 May 1943; CM-OUT-16097, Algiers to AGWAR, 25 May 1943; CM-IN-1957, Eisenhower to Arnold, 3 June 1943; CM-OUT-3272, CCS to Eisenhower, 8 June 1943; CM-IN-3107, AFHQ to WAR, 5 June 1943; CM-OUT-8585, Arnold to CG Eighth AF, 20 May 1943. During the period of preliminary planning the mission was criticized on the ground that only long and sustained attacks would have any real effect on Ploesti's oil production. (From documents in BAM [AHB].) The observation proved to be sound.

59. Ploesti Mission, Ninth U.S. Air Force, August 1, 1943 (cited hereinafter as Ploesti Mission); *The Brereton Diaries*, pp. 191-92; CM-IN-15896, Cairo to AGWAR, 25 June 1943; memo, sgd. Brereton, Operation Tidalwave, 2 July 1943. After the groups had begun training for the mission, General Devers (supported by Air Marshal Portal and General Eaker) urged that they first be used in a blow against German fighter factories at Wiener Neustadt, but the CCS rejected the proposal. (See CM-OUT-7556, C/S to Algiers, 19 July 1943, and CM-OUT-9495, CCS to Algiers, 23 July 1943; also CM-IN-14163, Adv. AFHQ to WAR, 20 July 1943; msg., Air Ministry to MAC, 16 July 1943; CM-IN-12257, USFOR to WAR, 17 July 1943; msg., Air Command Post to Air Ministry, 22 July 1943; msg., Air Ministry to MAC, 21 July 1943.) Opposition to the Devers proposal came from Generals Marshall, Eisenhower, Arnold, and Spaatz, and Air Marshal Tedder.

60. Ploesti Mission; CM-IN-14181, Adv. AFHQ to WAR, 20 July 1943.

61. For the working out of the plans, see AAFRH-3, pp. 31-47.

62. AAFRH-3, pp. 47-49.

63. CM-IN-16339, 17138, 987, Eaker to Marshall, 26, 27 June, 2 July 1943.

64. CM-IN-11479, Algiers to WAR, 18 June 1943; Brereton to CG AAF, 8 Aug. 1943, in Ploesti Mission; History, IX BC, Vol. IV.

65. AAFRH-3, pp. 61-79; CM-IN-14181, Adv. Hq. to WAR, 20 July 1943.

66. AAFRH-3, pp. 80-99; msg., Hq. RAFME to Air Command Post, 2 and 3 Aug. 1943.

67. AAFRH-3, p. 99; CM-IN-11891, Ankara to CNO, 15 Aug. 1943; CM-IN-11558, Steinhardt to Sec. of State, 13 Aug. 1943; CM-IN-1364, Cairo to AGWAR, 2 Aug. 1943; msg., R2E245 from IX BC, 2 Aug. 1943, supplied by BAM (AHB).

68. Lt. Col. W. L. Forster, Report on Roumanian Oil Targets, 13 Aug. 1943, with covering memo for ACM A. Tedder, Air C-in-C, MAC from Hq. RAFME, 14 Aug. 1943; Mr. L. Eisinger, Report on Roumanian Oil Targets, 22 Aug. 1943; Maj. John M. Wisdom, Target Info. Br., AFIOF, Damage Report to AFABI on Ploesti Oil Refineries; CM-IN-7846, from Steinhardt, 8 Aug. 1943; msg., IX BC to Air Comd. Post et al., 2 Aug. 1943, in BAM (AHB).

69. AAFRH-3, p. 107; msg., Forbes to Air C-in-C, 9 Dec. 1943.

70. CM-IN-11401, Cairo to AGWAR, 15 Aug. 1943.

71. Comments on the Execution of the First Phase of the Sicilian Combined Operations, in NAAF files (date and author not given, but on the basis of internal evidence it appears that the author was a high-ranking air officer); ltr., Lt. Gen. George Patton to Maj. Gen. Handy, 18 July 1943; Adv. Hq., DAF, Report on Lessons Learnt from Operation Husky, 15 Aug. 1943, in files of BAM (AHB).

72. Comments on Sicilian Operations, as cited in n. 71; Air Ministry, Air Attacks on Airfields: A Review of Methods Adopted and Weapons Used from the Commencement of the War to the Summer of 1943, dtd. Sept. 1943; Hq. NATAF, Memorandum on Lessons from Operation Husky, 18 Sept. 1943; The Rise and Fall of the German Air Force, Pt. 3, chap. 11, D of I (O), in files of BAM (AHB).

73. NATAF report; Report of Seventh Army; AFHQ Training Memo 50, Lessons from the Sicilian Campaign.

74. Incl. 7 to Allied Force Board Report on Airborne Operations in HUSKY; Hq. 64th Fighter Wing, Sum. of Opns.; Questions regarding the General Strategy during the Italian Campaign by Field Marshal Kesselring and General Westphal of the Cavalry, trans. by Ernest W. Matti, MS B270.

75. NATAF report; memo for C-in-C from Maj. Gen. J. P. Lucas, 26 Aug. 1943; Report by the Long Committee for D.M.T. (Brit.) North Africa, Combined Operations, 14 Oct. 1943.

76. Main Hq., Eighth Army, First Lessons from Husky, in files of BAM (AHB). The Eighth Army considered the communications as "generally excellent" but felt that they had been set up rather tardily. Desert Air Force was more critical, declaring that the land lines were laid too slowly, that there were not enough of them, and that the circuits were overburdened because too many headquarters had to have full signal facilities. (See Adv. Hq., DAF, Report on Lessons Learnt from Operation Husky, 15 Aug. 1943.)

77. See especially, monograph by Maj. Tewson, Air Support in Western Desert, North Africa, Sicily, Italy, chap. ix A, in files of BAM (AHB).

#### NOTES TO CHAPTER 15

1. TRIDENT, 1st, 5th, 6th Mtgs., 12, 24, 25 May 1943; JCS 290 and 290/1, 7 and 8 May 1943; JCS 78th Mtg., 8 May 1943; CCS 219, 223, 224, 14 May 1943; CCS 234, 235, 237/1, on 17, 18, 20 May 1943; CCS 242/6, 244/1, 250/1, 25 May 1943; Algiers conference, 1st, 2d, 3d Mtgs., 29 May-3 June 1943; Notes for C/S from G-3 Sec., AFHQ, Operations after Husky, P/85, 31 May 1943; memo for C/S from G-3 Sec., AFHQ, Outline Plan for Assault on Italian Mainland, 7 June 1943, P/72 (final); memo for C/S from G-3 Sec., AFHQ, Post-Husky Operations, P/92 (final), 28 June 1943.

2. Memo for C/S from G-3 Sec., AFHQ, Post-Husky Operations, P/92 (final), 28 June 1943; FAN 250, Eisenhower to AGWAR for CCS, 29 June 1943; FAN 165, CCS to Eisenhower, 17 July 1943; Fifth Army History, I, 17.

3. Memo for C/S from G-3 Sec., AFHQ, Command for Operations Against Corsica, 7 June 1943, P/89 (final); Minutes of Meeting of JCS with Pres. Roosevelt and Sec. Stimson, 10 Aug. 1943; CCS 106th Mtg., 14 Aug. 1943; MC-IN-7550, AGWAR (from CCS) to Eisenhower, 17 July 1943 in BAM (AHB); FAN 198, CCS for Eisenhower, 20 Aug. 1943; CM-IN-16715, Eisenhower to AGWAR for CCS,

22 Aug. 1943; CM-IN-9451, Eisenhower for Marshall, 13 Aug. 1943.

4. See Operations Record Book (ORB), MAC; Hq. MAC, Signals Report on Amphibious Operations in the Mediterranean from July to Sept. 1943, dtd. 22 Oct. 1943.

5. G-3 Sec., AFHQ, Appreciation of an Amphibious Assault Against the Naples Area, 24 July 1943, P/98 (final); memo for C/S from G-3 Sec., AFHQ, Comparison of Operations MUSKET and TOPHAT, 25 July 1943, P/100 (2d draft); memo for C/S from G-3 Sec., AFHQ, Outline Plan for Operation MUSKET, 24 July 1943, P/96 (final): For an early suggestion that a direct attack on Naples be made, see memo for C/S from Maj. Gen. George V. Strong, AC/S, G-2, 15 July 1943. For the plan for such an operation, see NAAF Opns. Instruction 1, Bigot-Barracuda, A-5/P.7 (final).

6. CM-OUT-10374, CCS to Eisenhower, 26 July 1943; CM-OUT-6683, CCS to CG Algiers, 16 July 1943; MC-IN-7550, AGWAR (from CCS) to Freedom Algiers, 17 July 1943.

7. CM-IN-19362, Eisenhower to AGWAR for CCS, 27 July 1943; NAF 303, Eisenhower to AGWAR for CCS, 28 July 1943; FAN 183, AGWAR (from CCS) to Eisenhower, 6 Aug. 1943; CM-IN-1142, AGWAR (from CCS) to Eisenhower, 2 Aug. 1943; CM-IN-3428, Eisenhower to AGWAR for CCS, 5 Aug. 1943; CM-IN-7355 (NAF 318), Freedom to AGWAR for CCS, 10 Aug. 1943; CM-OUT-3733, Eisenhower to C-in-C Med. *et al.*, 10 Aug. 1943. On 10 August 1943, NAAF announced in Memorandum: Operation BARRACUDA that the proposed direct assault on Naples was dead. How greatly the fall of Mussolini strengthened the idea of an invasion in the Naples area is indicated in a number of Signals, now in the files of BAM (AHB).

8. Signals Report on Amphibious Operations in the Med. from July to Sept. 1943; Hq. MAC to CG NAAF, Operations on the Italian Mainland, 31 July 1943, in ORB, MAC, App. I; Hq. NAAF, NAAF Planning Memo-Future Operations, No. 1, A-5/4316 (11 Aug. 1943); Minutes of a Conference Held at the Main Eighth Army at 1415 Hours, 5 Aug. 1943; CM-OUT-6685, Eisenhower to C-in-C Med. *et al.*, 16 Aug. 1943; NAF 326, Eisenhower



to AGWAR for CCS, 16 Aug. 1943; CM-OUT-7810, Eisenhower to L. S. Douglas, U.S. War Shipping Adm., 19 Aug. 1943; The Italian Campaign, Western Naval Task Force: Action Report of the Salerno Landings, Sept.-Oct. 1943, p. 68 (hereinafter cited as Western Naval Task Force); CM-IN-13987, Algiers to Quebec, 19 Aug. 1943; Notes on Meeting of Future Operations Held at La Marsa, 16 Aug. 1943.

9. 1st and 2d Mtgs. of President and Prime Minister with CCS, 19 and 23 Aug. 1943; Mtgs. 106-16 incl., CCS, 14-24 Aug. 1943; CCS 303, 303/3, 319, 319/5, 328/1, on 9, 17, 19, 24, 27 Aug. 1943.

10. Hq. NAAF, Provisional Outline Air Plan for Operations BUTTRESS and BAYTOWN, A-5/P.6 (final), 4 Aug. 1943; RAF Mediterranean Review No. 5, pp. 6, 12; MATAF, Operation Avalanche; Hq. DAF Opn. Instruction 10, n.d. DAF was responsible for detailed planning for BAYTOWN. (See SCORU Signal 0534, Air Comd. Post to RAF/ME, 14 Aug. 1943, in BAM [AHB].)

11. History, Fifth Army, I, 25-28; Hq. Fifth Army, Outline Plan, Operation AVALANCHE, 26 Aug. 1943.

12. Western Naval Task Force, pp. 76-82.

13. Notes on the Air Implication of an Assault on Italian Mainland-Naples Area, n.d.; MATAF, Operation Avalanche; NAAF, Provisional Outline Plan of Air Operations, Operation AVALANCHE, App. E; Notes on a Conference Held at NAAF Headquarters on 28 August 1943; various messages (July 1943) in files of BAM (AHB). NATAF was responsible for detailed planning for AVALANCHE. (See SCORU Signal 0534, Air Comd. Post to RAF/ME, 4 Aug. 1943.)

14. NAAF 303, Eisenhower to AGWAR for CCS, 28 July 1943; CM-OUT-323 (FAN 180), AGWAR (from CCS) to Eisenhower, 2 Aug. 1943; CM-IN-8737, Eisenhower to AGWAR for CCS, 12 Aug. 1943; CM-IN-21175, USFOR to WAR, 29 July 1943; msg. 4170, Devers to Eisenhower, 29 July 1943, in BAM (AHB); CM-IN-10280, Devers to Marshall and Arnold, 14 Aug. 1943; CM-IN-20257 and 21774, Algiers to WAR, 28 and 30 July 1943; msg., Air Comd. Post to Air Ministry, 26 July 1943, in BAM (AHB); CM-IN-12549, Eisenhower to Marshall, 17

Aug. 1943; CM-IN-14200, Eisenhower to AGWAR for CCS, 19 Aug. 1943; CM-IN-14807, Arnold to Eisenhower, 20 Aug. 1943; AC/AS, Plans, Hq. AAF, Division Digest, 2 Aug. 1943; Hq. 12th AF, Operations and Statistics of Twelfth Air Force; CM-OUT-1137, Marshall to Devers and Eisenhower, 4 Aug. 1943; CM-IN-3986, Eisenhower to Marshall, 5 Sept. 1943; ltrs., Spaatz to Arnold, 24 May and 14 July 1943; CM-IN-7355, AFHQ to WAR *et al.*, 10 Aug. 1943; C.O.S. (W) 742, 30 July 1943, in files of BAM (AHB); CM-IN-1739, Algiers to WAR, 3 Aug. 1943; ltr., Arnold to Spaatz, 20 Aug. 1943; memo for Marshall from Deane, 1 Aug. 1943; memo for Marshall from Arnold, 1 May 1943; CM-OUT-815, Arnold to Spaatz, 13 Aug. 1943. For an interesting statement by Air Marshal Welsh on Arnold's opposition to Eisenhower's requests for more bombers, see messages in files of BAM (AHB).

15. Hq. MAC to CG NAAF, Operations on the Italian Mainland, 31 July 1943; C-in-C Med. to First Sea Lord, 29 July 1943, in files of BAM (AHB).

16. CM-OUT-2541, Marshall to Eisenhower and Brereton, 7 Aug. 1943; CM-OUT-2371, Arnold to Brereton, 6 Aug. 1943; CM-OUT-959, Marshall to Devers, 3 Aug. 1943; CM-IN-3305, Devers to Marshall, 5 Aug. 1943; CM-OUT-13047, Spaatz sgd. Eisenhower to Arnold, 18 Aug. 1943; CM-IN-17506, Brereton to AGWAR for Arnold and Marshall, 23 Aug. 1943; CM-IN-20872, Algiers to WAR, 29 July 1943; CM-IN-12861, Adv. AFHQ to WAR, 18 July 1943; CM-IN-18219, Eisenhower to AGWAR, 24 Aug. 1943; CM-IN-22388, Brereton to AGWAR for Arnold and Marshall, 29 Aug. 1943; CM-IN-23053, Brereton to Marshall *et al.*, 30 Aug. 1943; CM-IN-2430, Cairo to AGWAR, 30 July 1943; ltr., Brig. Gen. Victor H. Strahm to Gen. Arnold, 22 Aug. 1943; draft history, 12th AF, Pt. I, chap. xi.

17. CM-OUT-11728, C-in-C Med. to 15th Army Gp., 31 July 1943; CM-IN-668, Eisenhower to AGWAR for CCS, 1 Aug. 1943; CCS 280/5, 6 Aug. 1943; CM-IN-6608, Eisenhower to AGWAR for CCS, 11 Oct. 1943; CM-OUT-2987, CCS to Algiers, 8 Aug. 1943. For the story of glider erection in the theater, see Hq. AAFSC/MTO, Aircraft and Glider Assembly in the MTO; XII TCC (Prov.), A Report of

TCC Activities Including the Italian Campaign, 1 Aug.-30 Sept. 1943; NATCC (Prov.), Report of Operations and Activities Including the Sicilian Campaign, 18 May-31 July 1943. For the Wellingtons see BR 1736-30, Admiralty Battle Sum. 37, The Invasion of Italy, p. 7, in BAM (AHB).

18. Msg. 6099, Eisenhower to Marshall, n.d., in BAM (AHB).

19. CM-IN-14200, Eisenhower to AGWAR for CCS, 19 Aug. 1943; Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final).

20. Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final); NAAF Organizational Chart, prep. by 23d SCORU, 24 Aug. 1943.

21. Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final); memo for Hq. NAAF (Adv.) from AVM H.P. Lloyd, 16 Aug. 1943; History, 12th AF, Vol. IV, The Twelfth Air Force in the Southern Italian Campaign; MACAF, Mare Nostrum, A Review of MACAF Operations, Mar. 1943-Sept. 1944, p. 2; MATAF, Operation Avalanche; CM-IN-19575, Eisenhower for Marshall, 26 Aug. 1943; msg., MAC to NAAF, 26 Aug. 1943. See also, msg. G-132, Spaatz to Tedder, 18 Aug. 1943, MC-OUT-12526, MAC to USFOR, 31 Aug. 1943, and other msg., in files of BAM (AHB). For further details of the career of the antisubmarine squadron, see AAFRH-7, The Antisubmarine Command. For the story of the re-creation and training of the FAF, see The French Air Force in MAAF, A Preliminary History.

22. Hq., 12th Fighter Wing (Prov.), Annex 2 to FO 2, 6 Sept. 1943, in Operations (Sp.), Pt. IV, 12th Fighter Wing; MATAF, Operation Avalanche; Hq. TAF, Operational Directif for Operation "Avalanche" No. 1.

23. Notes on the Air Implication of an Assault on Italian Mainland-Naples Area, in file III-A, reel 39, file 62, MAAF; NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final); CM-IN-23717, Eisenhower to AGWAR for CCS, 31 Aug. 1943; MATAF, Operation Avalanche; Western Naval Task Force, p. 200.

24. Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8

(final); CM-IN-23717, Eisenhower to AGWAR for CCS, 31 Aug. 1943; Hq., 12th FW (Prov.) FO 2; Estimate of Build-up of Air Forces on the Italian Mainland, n.d., no hq., in file III-A, reel 39, file 62, MAAF.

25. Ltr., Hq. XII ASC to All Concerned, 26 Aug. 1943, in file III-A, reel 39, file 63, MAAF; Hq. 12th FW FO 2; CM-IN-3402, from Algiers, 4 Sept. 1943, in AC/AS, Plans, European Br.

26. Hq., Fifth Army, App. H to Annex 6, 24 Aug. 1943, in file III-A, reel 39, file 63, MAAF; Hq., Allied Central Med. Force, Air Support Control Arrangements for Operation "Avalanche," 25 Jan. 1944; memo., Hq. TAF to Hq., XII ASC, *et al.*, 30 Aug. 1943.

27. Western Naval Task Force, p. 198.

28. MC-OUT-11728, C-in-C, Med. to 15th Army Gp., 31 July 1943, in file III-A, reel 39, file 62, MAAF; CM-IN-23717, Eisenhower to AGWAR for CCS, 31 Aug. 1943; TCC Warning Order 2, 1 Sept. 1943; Hq. XII TCC (Prov.), A Report of TCC Activities, Including the Italian Campaign, 1 Aug.-30 Sept. 1943; History, 52d TCW, Aug. 1943.

29. Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final); Mare Nostrum. For improvement and extension of air-sea rescue operations, see CM-IN-17056, Eisenhower to AGWAR for CCS, 22 Aug. 1943, and Directive, Hq. No. 242 Gp., RAF to NACAF *et al.*, 3 Sept. 1943, in Operations (Sp.) Avalanche.

30. History of AAFSC/MTO, 1 Jan. 1944-30 June 1944; Historical Data, MATS, 25 May 1943-31 May 1944; memo, AFHQ to All Concerned, Air Transport Service, 26 Aug. 1943, in ORB, MAC, App. W; Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final).

31. History, NAPRW, 16 Oct. 1943; Hq. AGF, Observers' Notes on the Italian Campaign, During the Period 25 Aug. to 7 Sept. 1943, incl., 5 Dec. 1943.

32. Hq. AAFSC/MTO, History of the Original XII AFSC; Hq. AAFSC/MTO, Aircraft and Glider Assembly in the MTO, Dec. 1942-Dec. 1944.

33. History of the Original XII AFSC.

34. Draft history, 12th AF, Pt. I, chap. xi; Administrative History, 12th AF, Pt. 1.

35. Administrative History, 12th AF, Pt. 1.

36. TAF Opn. Directive 132, 23 Aug. 1943; unit histories of groups and squadrons of TAF, Aug.-Sept. 1943.

37. Hq. NAAF, Provisional Outline Air Plan for Operation "Avalanche," A-5/P.8 (final), and for Operations BUTTRESS and BAYTOWN, A-5/P.6 (final).

38. OSS paper, Air Attacks Against Bridges and Marshalling Yards, 7 Mar. 1944.

39. NAAF/A.5/COM 2 and COM 3, 12 Aug. and 4 Sept. 1943, in BAM (AHB).

40. Twelfth Air Force in Southern Italian Campaign; RAF Mediterranean Review No. 5; ltr., Spaatz to Arnold, 21 Sept. 1943; TAF Opn. Directive 132, 23 Aug. 1943.

41. Unless otherwise noted, the summary of the bombing effort, 18 August-2 September, is taken from NAAF Air Intel. Weekly Sums. 40-42; RAF Med. Review No. 5; NASAF Intops Sums. 28-44; NATAF Int/Opsums 130-46. See also W. M. Gould, the Southern Italian Campaign (draft), pp. 162-79, in BAM (AHB).

42. CM-IN-16897, from 12th AF, 27 Oct. 1943 (paraphrase). The terrific damage inflicted on Foggia by the air forces was observed by the writer in the first week of December 1943.

43. Ltrs., Spaatz to Arnold, 4 and 21 Sept. 1943; RAF Med. Review No. 5.

44. Cositintreps 49-50 and 179-94 refer briefly to the air reconnaissance and commando raids. The latter took place on the nights of 26 and 27 August.

45. The summary of the Axis air effort, both offensive and defensive, is from NAAF Air Intel. Weekly Sums. 40-42; NASAF Intops Sums. 27-43; Mare Nostrum. See also, Report by No. 242 Gp. to NACAF, 23 Aug. 1943, in files of BAM (AHB).

46. NAAF/A.I.W.S., Aug.-Sept. 1943; NAAF, Daily Intops Sums., Aug.-Sept. 1943.

47. Figures on GAF strength in the Mediterranean supplied by the British Air Ministry, through the courtesy of Mr. J. C. Nerney. See also RAF Mediterranean Review No. 6. Abteilung 6, German Air Ministry Returns as of 31 August 1943 (made available to the author by S/Ldr. L. A. Jackets of BAM [AHB]) gives the

GAF strength as 999 combat planes, of which 568 were serviceable. NAAF estimated the GAF strength as of 3 September at 1,045 planes, of which 408 were serviceable. (See NACAF Opns. Order 3, App. A, 3 Sept. 1943.)

48. Questions Regarding the General Strategy During the Italian Campaign by Field Marshal Kesselring and General Westphal of the Cavalry, trans. by Ernest W. Matti, MS B270 (hereinafter cited as Kesselring Questions); German Hist. Br., German Air Force Activities in the Mediterranean, Tactics and Lessons Learned, 1941-1943, dtd. 30 Oct. 1943, trans. by BAM (AHB), 8 Oct. 1946, and made available by Mr. J. C. Nerney.

49. Ltr., Spaatz to Arnold, 21 Sept. 1943.

50. NAAF Air Intel. Weekly Sum. 42; data supplied by BAM (AHB).

51. The fact that Italy would announce its surrender on 8 September does not materially affect the Italian air potential as of 3 September, for there was no way for the Allies to know at that time how many of the Italian planes would be flown against BAYTOWN either by Italian Fascists or by Germans. It is true, however, that during the week of 3-9 September the greater part of the IAF was grounded because the Germans had denied fuel to most of its planes.

52. App. A to NACAF Opn. Order 3, 3 Sept. 1943; A.C.A.S. (1), Estimate of Enemy Opposition, 1 Sept. 1943; NAF 345 to C.O.S. Mtg., 2 Sept. 1943, quoted in A.C.A.S. (P), all three items in BAM (AHB).

53. RAF Med. Review No. 5.

54. Bernard L. Montgomery, *El Alamein to the River Sangro* (1946), p. 123; RAF Med. Review No. 5; NAAF Air Intel. Weekly Sum. 42; NATAF, Operation Avalanche; NATAF Int/Opsums 146-47; NAAF, Operations Record Book, appendices.

55. NAAF Opn. Sum. 195; NASAF Intops Sum. 44; CM-IN-3181, Spaatz to AGWAR sgd. Eisenhower, 4 Sept. 1943; RAF Med. Review No. 5; NATAF Int/Opsums 146-47; NAAF, ORB, apps.

56. Except for such additional sources as may be listed in subsequent footnotes, the discussion of ground and air operations on the Toe (Calabria) from 4 through 8 September is based upon the

following: RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 42-43; NAAF Opnl. and Intel. Sums. 195-96; NASAF Intops Sums. 44-47; NAAF, ORB, appss.; AFHQ, G-2 Weekly Sums.

57. According to Gen. Heinrich von Vietinghoff, commander of the German 10th Army, the Germans had never intended to make a real fight for Calabria because of poor lines of communication. (See Canadian Hist. Sec., Report 18, p. 3, based on captured German documents, in files of BAM [AHB].)

58. CM-IN-4121, Spaatz to AGWAR sgd. Eisenhower, 5 Sept. 1943.

59. Hq. 12th AF, Operations and Statistics of Twelfth Air Force.

60. NAPRW, Detailed Interp. Rpt. D.S. 25, 17 Sept. 1943; additional data from files of BAM (AHB). From 31 August through 8 September, TAF's planes flew 4,968 sorties; DAF flew 3,024; TBF 1,376; and XII ASC 568. Claims were 25/2/6 against losses of 9/0/17. (MATAF, Report on AVALANCHE.)

61. Details of Strategic's operations from 3 through 8 September are largely from RAF Med. Review Nos. 5 and 6; NAAF Air Intel. Weekly Sums. 42-43; NAAF Opnl. and Intel. Sums. 195-201; NASAF Intops Sums. 43-48; msgss., Spaatz to AGWAR sgd. Eisenhower, 4, 5, 6, 7 Sept. 1943; NAPRW, Detailed Interp. Rpt. D.S. 25, 17 Sept. 1943; Hq. 12th AF, Operations and Statistics of Twelfth Air Force; Hq. XII BC, Salerno Operations. Other sources are given in appropriate footnotes.

62. The German Todt Organization, depending largely on Italians pressed into service, had repaired much of the damage to communications which NAAF had inflicted before BAYTOWN (from information supplied by W. M. Gould, BAM [AHB]).

63. Msg., Air Command Post, MAC to CG NASAF, 6 Sept. 1943, in NATAF directive, Operation AVALANCHE.

64. See also, Narrative Account, 2d Bomb. Gp. (H), Sept. 1943; Rpts. by Operational Research Sec., Hq. RAF/ME, RE, Med. Air Operations During 1943. Apparently, this was the first use by the Luftwaffe of the radar-jamming strips. (See CSDIC, AFHQ Rpt. A. 212, 25 Sept. 1943, in BAM [AHB].)

65. See also, Hq. MACAF, Their Victory; Mare Nostrum No. 52.

66. CM-IN-13134 (?), CCS to Eisenhower, 18 Aug. 1943; CM-IN-13517, Eisenhower to AGWAR for CCS, 18 Aug. 1943; CM-IN-524, C-in-C (Eisenhower) to AGWAR for CCS, 1 Sept. 1943; CM-IN-2225, 4870, 5963, Eisenhower to AGWAR for CCS, on 3, 6, 8 Sept. 1943; A Report of TCC Activities Including the Italian Campaign; Hq. NAAF, Operation AVALANCHE, Amend. 1; Outline History, 51st TCW, 17 Aug.-30 Sept. 1943; Giant Two Outline Plan, 3 Sept. 1943, in G-3 Journal, 82d AB Div., 1-15 Sept. 1943; memo for AC/AS-3 from Gen. Taylor Mission to Rome, 9 Sept. 1943. For a full discussion of the negotiations between General Eisenhower and the Italians, see draft of chap. iv, Vol. II, Mediterranean Series, "The Sicilian Campaign and the Surrender of Italy," in *U.S. Army in World War II*, WDSS-HD. For an early decision of the Germans to strengthen their forces in the Rome area, see Extracts from Reports of Fuehrer Conferences, Conference of 26 July 1943, trans. by BAM (AHB), 18 Oct. 1947. For two interesting stories of the Taylor-Gardiner mission, see David Brown, "The Inside Story of Italy's Surrender," in *Saturday Evening Post*, Vol. 217 (16 Sept. 1944), and Richard Threlson and Elliott Arnold, "Secret Mission to Rome," in *Harper's Magazine*, Vol. 189 (Oct. 1944).

67. Western Naval Task Force, pp. 8-12; memo for CG 1st Marine Amphibious Corps from the Comdt. USMC, 11 Nov. 1943; Signals Report on Amphibious Operations in the Med. from July to Sept. 1943; A/Cdre. Scarlett-Streatfield, Report on Operation "Avalanche," 16 Dec. 1943; C-in-C Med., Despatch on the Salerno Landings; Report of Flag Officer, Force 11, 4 Dec. 1943. Admiralty Battle Sum. on Salerno. The last four documents are in the files of the BAM (AHB).

68. The Germans had good reason to expect a landing on the Salerno plain on or about 9 September. They knew that the beaches were good, and the moon favorable. They had noted the pattern of Allied attacks on radar sites and communications, and on the airfields around Naples and Foggia. They figured logically that the Allies would try to cut off the

German troops in the south. Captured German documents in the possession of the British Air Ministry show that the enemy expected AVALANCHE and had disposed his troops accordingly. Gen. Heinrich von Vietinghoff, commander of the German 10th Army, had written on 11 August that Allied landings in the Naples-Salerno sector "represent the main danger to the whole of the German forces in Southern Italy." On 29 August he had expressed the conviction that the Allies would land on the Toe but that the main landing would be in the Naples-Salerno area. (See Canadian Hist. Sec., Rpt. 18. Those parts of the report which deal with the Germans' understanding of Allied intentions are based largely on captured German documents, especially 10th Army War Diary. See also Salerno, captured German doc., in files of BAM [AHB].)

69. Western Naval Task Force, pp. 9-12 and 137-54; History, Fifth Army, I, 31-34; memo for CG 1st Marine Amph. Corps from Comdt. USMC, 11 Nov. 1943; "Die Engl.-Amerikanische Grosslandung im Raum von Salerno am 9 Sept. 1943," which contains some useful text and a number of excellent maps and charts.

70. Hq. NATAF, Operation Avalanche; NAAF Monthly Opns. Bulletin 6; Brit. War Office, Current Reports from Overseas, No. 29, 11 Mar. 1944; Rear Adm. P. Vian, Report of Proceedings of Force V, 23 Sept. 1943, in BAM (AHB).

71. NAAF Opnl. and Intel. Sum. 202; Current Reports from Overseas, No. 29, 11 Nov. 1943; additional data from files of BAM (AHB). The average strength of the Seafire patrols was just over twenty. (See Report of Flag Officer, Force V, App. 2 [M. 012034/43], in files of BAM [AHB].)

72. It appears that four other factors also were responsible for the poor assistance given by *Ancon* to the day fighters: there was a thick mist on shore; the ship was not well equipped and was badly located; some frequencies had been arbitrarily changed; the control center was not receiving enough information from troops ashore. (See especially, Minutes by Dir. of Opns. [A.D.] to A.C.A.S. [Opns.], 29 Nov. 1943; RAF Signals in the War, 1939-45, Vol. IV [draft]; Minutes of a

Meeting Held at the Admiralty, 20 Oct. 1943.)

73. Western Naval Task Force, pp. 11-18; NATAF, Operation Avalanche; NAAF Opnl. and Intel. Sum. 202; RAF Med. Review No. 5; Hq. MAC, Signals Report on Amphibious Operations.

74. Western Naval Task Force, pp. 142-43.

75. NATAF, Operation Avalanche; NAAF Opnl. and Intel. Sums. 201-2; NAAF Monthly Opns. Bulletin 6; MAC, War Room Monthly Sum. of Opns., Sept. 1943, in files of BAM (AHB); Admiralty Battle Sum. on Salerno, pp. 40, 52; NAAF Air Intel. Weekly Sum. 43; RAF Med. Review No. 5; memo from Comdt., USMC, 11 Nov. 1943, incl. B; File 77 (Reports); additional data from BAM (AHB). For the figures taken from captured German documents, see W. M. Gould, The Southern Italian Campaign (draft), in files of BAM (AHB).

76. Western Naval Task Force, pp. 11-18; NAAF Opnl. and Intel. Sums. 201-2; NATAF, Opn. Avalanche; Admiralty Battle Sum. on Salerno; War Diary of German Naval Staff, in BAM (AHB).

77. NAAF Opnl. and Intel. Sums. 201-2; NAAF Air Intel. Weekly Sum. 43; RAF Med. Review No. 5; Hq. 12th AF, Operations and Statistics of Twelfth Air Force; Hq. XII BC, Salerno Operations; NASAF Intops Sum. 49.

78. NAAF Opnl. and Intel. Sums. 201-2; CM-IN-7325, Eisenhower to AGWAR for CCS, 9 Sept. 1943.

79. History, Fifth Army, I, 34-37.

80. Report of CG XII ASC, in Western Naval Task Force, p. 19; CM-IN-9301, Eisenhower to AGWAR, 11 Sept. 1943; CM-OUT-8285, Arnold to Eisenhower, 17 Sept. 1943; Western Naval Task Force, pp. 18-30; NAAF Opnl. and Intel. Sums. 202-4; NAAF Air Intel. Weekly Sums. 43-44; NATAF, Opn. Avalanche; British War Office, Current Reports from Overseas, No. 29, 11 Mar. 1943; NAAF Monthly Opns. Bulletin 6; CM-IN-9538, C-in-C Med. (Eisenhower) to AGWAR, 12 Sept. 1943; RAF Med. Review No. 5; Admiralty Battle Sum. on Salerno, p. 58; War Diary of German Naval Staff.

81. Memo from Comdt., USMC, 11 Nov. 1943, incl. B.

82. Air Ministry Weekly Intel. Sum.



220; additional data from files of BAM (AHB).

83. NAAF Monthly Opns. Bulletin 6; Western Naval Task Force, pp. 20, 25.

84. Hq. XII ASC Adm. Order 2, Apps. 1-2, 25 Aug. 1943; Brit. Current Reports from Overseas, No. 29; Hq. NAAF, Outline Administrative Plan, Operation Avalanche; History, Original XII AFSC, pp. 190-91, 195-97; TWX, CG XII ASC (Adv.) to 27th Bomb. Gp. *et al.*, 0800 hrs., 11 Sept. 1943, in 12th FW (Prov.), Opns. (Sp.), Msgs., Pt. III; Twelfth Air Force in the Southern Italian Campaign; NAAF Monthly Opns. Bulletin 7; History, 33d Fighter Gp., Sept. 1943.

85. CM-IN-9538, C-in-C Med. (Eisenhower) to AGWAR, 12 Sept. 1943; Western Naval Task Force, p. 30; NATAF, Operation Avalanche. Full employment of the fields was somewhat delayed when the U.S. Navy on the 13th diverted to its own use the craft which were being used to bring air force units to the bridgehead so that for the next week few such personnel came ashore. (See Hq. TAF, Report on Movement and Supply Aspects of the Operation Avalanche, 9 Oct. 1943, in BAM [AHB].)

86. TWX, MAC Post G160 to NASAF and NATAF, 9 Sept. 1943, in 12th FW, Opns. (Sp.), Avalanche; CM-IN-8175, Eisenhower to AGWAR for CCS, 10 Sept. 1943.

87. The details of NAAF's operations on 10 and 11 September may be found in RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 43-44; NAAF Opnl. and Intel. Sums. 202-4; NAPRW Detailed Interp. Rpt. D.S. 25; XII BC, Salerno Operations; NASAF Intops Sums. 50-51; NATAF Int/Opsums 153-54.

88. Memo on Air Support Control Arrangements at Hq., Fifth Army, in BAM (AHB).

89. See particularly, NAAF Monthly Opns. Bulletin 7; memo for CG VI Corps from Col. E. M. Edmonson, 26 Sept. 1943.

90. NAAF Opnl. and Intel. Sums. 202-4.

91. *Ibid.*; RAF Med. Review No. 5; NAAF Air Intel. Weekly Sum. 44.

92. CM-IN-7325, C-in-C (Eisenhower) to AGWAR for CCS, 9 Sept. 1943; Western Naval Task Force, p. 5; RAF Med. Review No. 5; NAAF Opnl. and Intel.

Sum. 202; NAAF Air Intel. Weekly Sum. 44.

93. History, Fifth Army, I, 37-40; Admiralty Battle Sum. on Salerno; Fuehrer Conferences on Naval Affairs; German War Diaries of Naval Staff (Opns.) and of Naval Command, Italy; captured German docs.; Kesselring Questions.

94. History, Fifth Army, I, 37-40; History, Original XII AFSC; histories, 27th Fighter-Bomber Gp. and 33d Fighter Gp., Sept. 1943.

95. History, Fifth Army, I, 37-40.

96. Western Naval Task Force, pp. 3, 36, 39-41, 43, 231-32; Admiralty Battle Sum. on Salerno.

97. Western Naval Task Force, pp. 46, 231; NAAF Monthly Opns. Bulletin 7; CM-IN-19737, Comdr. 8th Fleet (OPS) to (?), 21 Sept. 1943.

98. NAAF, Opnl. and Intel. Sums. 204-5; RAF Med. Review Nos. 5-6; NAAF Monthly Opns. Bulletins 6-7; TWX, MAC Post G160 to NASAF and NATAF, 9 Sept. 1943, in Opns. (Sp.) Avalanche; TWX, CG XII ASC (Rear) to CG XII ASC (Adv.), 11 Sept. 1943, in History, 12th FW (Prov.), Opns. (Sp.), Msgs., Pt. III; TWX, Col. Kyle, CO 12th FW (Prov.) to Gen. Doolittle, 11 Sept. 1943, in same doc.; Western Naval Task Force, pp. 32, 196-97; Brit. Current Reports from Overseas, No. 29; Signals Report of Amphibious Operations in the Med., 22 Oct. 1943; Air Ministry Weekly Intel. Sum. 220; CM-IN-19012, Spaatz to AGWAR sgd. Eisenhower, 26 Sept. 1943; History, 33d Ftr. Gp., Sept. 1943; Hq. Allied Central Med. Force, Air Support Control Arrangements for Operation "Avalanche," 25 Jan. 1943; NAAF Air Intel. Weekly Sum. 44; NASAF, Intops Sums. 52-53; NAPRW Detailed Interp. Rpt. D.S. 29; Hq. XII BC, Salerno Operations.

99. The details of GIANT I (Revised), GIANT IV, and GIANT III are from Hq. XII TCC (Prov.), A Report of XII TCC Activities, Including the Italian Campaign, which contains all of the basic documents; histories, 51st and 52d TCW, Sept. 1943; Rpts. by Operational Research Sec., Hq. RAF/ME, RE, Med. Air Operations During 1943; NAAF Monthly Opns. Bulletin 7; *ltr.*, Brig. Gen. P. L. Williams to CG 12th AF, 20 Sept. 1943; memo for CG 12th AF from Williams, Report of



Troop Carrier Command Operation "Avalanche," 18 Sept. 1943; a preliminary report by Maj. P. D. Mulcahy, AFHQ observer, Airborne Activities in the Italian Campaign; Comments on the Bigot-Avalanche Operation with Regard to the Airborne Use (no author, no date).

100. CCS, 120th Mtg., 24 Sept. 1943; CM-OUT-1375, CCS to Eisenhower, 4 Nov. 1943.

101. NAAF's operations on 14 and 15 September are from the following: histories, 14th Ftr. Gp. and 310th Bomb. Gp., Sept. 1943; RAF Med. Review No. 5; NAAF Opnl. and Intel. Sums. 206-8; NAAF Air Intel. Weekly Sum. 44; NASAF Intops Sums. 54-55; 12th AF, Operations and Statistics of 12th AF (Supplement); NAPRW Detailed Interp. Rpt. D.S. 25; XII BC, Salerno Operations; CM-IN-12769, Spaatz to AGWAR sgd. Eisenhower, 16 Sept. 1943; CM-IN-11726, C-in-C (Eisenhower) to AGWAR for CCS, 15 Sept. 1943; CM-IN-15923, MAC to (?), 21 Sept. 1943; Adv. Liaison Gp., AFHQ to AGWAR *et al.*, 14 Sept. 1943; 12th AF, A History of the 42d Bomb. Wing; MAC, War Room Sums., Sept. 1943; Hq. NAAF, Operational Record Book.

102. See various cables from Eisenhower and Spaatz to AGWAR during September 1943, particularly CM-IN-20612, Spaatz to AGWAR sgd. Eisenhower, 29 Sept. 1943.

103. History, 310th Bomb. Gp., Sept. 1943.

104. See ltr., CG AAF to CG AGF, 23 Sept. 1943, and 1st ind.

105. 12th AF, Operations and Statistics of 12th AF (Supplement); CM-IN-15923, MAC to (?), 21 Sept. 1943; CM-IN-11026, C-in-C (Eisenhower) to AGWAR for CCS, 14 Sept. 1943; ltr., Spaatz to Arnold, 21 Sept. 1943.

106. CM-IN-12313, Eisenhower to AGWAR for CCS, 16 Sept. 1943; German Naval War Diaries, Sept. 1943, and German War Diaries of AOK 10, in BAM (AHB).

107. Ltr., Spaatz to Arnold, 21 Sept. 1943.

108. RAF Med. Review No. 5; History, 12th Bomb. Gp. (M), Dec. 1943; CM-IN-15558, C-in-C (Eisenhower) to AGWAR

for CCS, 21 Sept. 1943; ltr., Eisenhower to Marshall, 13 Sept. 1943.

109. CM-IN-12128, Devers to Marshall, 16 Sept. 1943; CM-IN-11726, C-in-C (Eisenhower) to AGWAR for CCS, 15 Sept. 1943; msg., Air Command Post to Air Ministry, 10 Sept. 1943; CM-OUT-7196, JCS to Devers, 15 Sept. 1943; ltr., Eisenhower to Marshall, 20 Sept. 1943; ltr., Eaker to Arnold, 1 Oct. 1943. For the operations of the borrowed B-24's from 21 September through 1 October, see unit histories of 44th, 93d, and 389th Bomb. Gps., and ltr., Eaker to Arnold, cited just above.

110. CM-IN-10974, Eisenhower to Marshall, 14 Sept. 1943; ltr., Doolittle to B. M. Giles, C/AS, 19 Sept. 1943; memo for Gen. Upston by Brig. Gen. H. A. Craig, AC/AS, OC&R, 15 Sept. 1943; CM-OUT-10325, Marshall to Eisenhower, 22 Sept. 1943; ltr., Giles to Doolittle, 9 Oct. 1943.

111. NAAF Opnl. and Intel. Sums. 201-7; NAAF Air Intel. Weekly Sums. 43-44; Hq. AGF, Observers' Notes on the Italian Campaign, During the Period 25 Aug. to 7 Oct. 1943; NATAF Report on Avalanche.

112. 12th AF, Operations and Statistics of 12th AF (Supplement); NAAF Opnl. and Intel. Sums. 193-208; ltr., Spaatz to Arnold, 21 Sept. 1943; Hq. MACAF, Mare Nostrum.

113. RAF Med. Review No. 5; NAAF Opnl. and Intel. Sums. 204-8; Western Naval Task Force, pp. 33-34; Hq. European Command, Report by Brig. Gen. Hirschhold, Commitment of German Air Forces in Sardinia and Corsica (trans.).

114. History, Fifth Army, I, 41-48; RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 45-46.

115. Ltr., Spaatz to Arnold, 21 Sept. 1943; CM-IN-13177, Spaatz to AGWAR sgd. Eisenhower, 17 Sept. 1943; RAF Med. Review No. 5; NAAF Opnl. and Intel. Sums. 208-12; NAAF Air Intel. Weekly Sum. 44; Hq. 12th AF, History of 42d Bomb. Wing.

116. CM-IN-12313, Eisenhower to AGWAR for CCS, 16 Sept. 1943.

117. Operations and Statistics of 12th AF (Sup.); RAF Med. Review No. 5; NAAF Opnl. and Intel. Sums. 208-12; NASAF Intops Sums. 56-59; Western Naval Task Force, pp. 40-48; NAAF Air

Intel. Sums. 44-45; msg., CTF 80 to C-in-C Med. *et al.*, 16 Sept. 1943; Bomber Build-up for and Support of Salerno Landings, in BAM (AHB).

118. See n. 117, and Hq. Allied Central Med. Force, Air Support Control Arrangements for Operation "Avalanche," 25 Jan. 1944; Signals Rpt. on Amphibious Operations in the Med. from July to Sept. 1943; MAC, War Room Sum., Sept. 1943; NAAF, ORB, apps., in files of BAM (AHB).

119. RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 44-45; NAAF Opnl. and Intel. Sums. 209-12; NASAF Intops Sums. 56-59.

120. NAAF Opnl. and Intel. Sums. 212-21; RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 45-46; British Hist. Sec., Central Med., Eighth Army Operations, Reggio to Ortona, in BAM (AHB).

121. CM-IN-15923, MAC to (?), 21 Sept. 1943; ltr., Spaatz to Arnold, 21 Sept. 1943; History, 42d Bomb. Wing; Hq. AGF, Observers' Notes on the Italian Campaign.

122. RAF Med. Review No. 5; NAAF Air Intel. Weekly Sum. 45; NAAF Opnl. and Intel. Sums. 212-17; NASAF Intops Sums. 90-94.

123. Histories, 14th Ftr. Gp. and 320th Bomb. Gp., Sept.-Oct. 1943; NAAF Opnl. and Intel. Sum. 217; History, 42d Bomb. Wing; NASAF Intops Sum. 65; CM-IN-19095, Spaatz to AGWAR sgd. Eisenhower, 26 Sept. 1943; CM-IN-15539, C-in-C (Eisenhower) to AGWAR for CCS, 21 Sept. 1943; NAAF Monthly Opns. Bulletin 6; CM-IN-12910, Spaatz to AGWAR for Arnold sgd. Eisenhower, 17 Sept. 1943. See also, ltr., Doolittle to B. M. Giles, 19 Sept. 1943.

124. RAF Med. Review No. 5; NAAF Air Intel. Weekly Sum. 46; NAAF Opnl. and Intel. Sums. 217-23; NASAF Intops Sums. 65-71.

125. RAF Med. Review No. 5; History, Original XII AFSC, pp. 198-202; CM-IN-19095, Spaatz to AGWAR sgd. Eisenhower, 26 Sept. 1943; History, 51st TCW, 17 Aug.-30 Sept. 1943.

126. CM-IN-15539, C-in-C (Eisenhower) to AGWAR for CCS, 21 Sept. 1942; RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 45-46; NAAF Opnl. and Intel. Sums. 213-18; NASAF Intops Sums. 61-65; Air Ministry Weekly Intel.

Sum. 215; History, XII Ftr. Comd., June 1943-Jan. 1944; MACAF, Mare Nostrum; Hirschhold Rpt., as in n. 113; NAAF, ORB, apps.

127. RAF Med. Review No. 5; Western Naval Task Force, pp. 49-51, 55-65; NAAF Air Intel. Weekly Sums. 45-46; Admiralty Battle Sum. on Salerno; NAAF, Report on Air Operations, Operation Avalanche.

128. History, Fifth Army, I, 41-48; RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 45-46.

129. According to the Admiralty, the figures on Allied shipping losses presented by Admiral Hewitt were incorrect, as they included some ships which took no part in AVALANCHE or which were sunk after the invasion had been completed. (See Admiralty Report BR 1736 [30], Battle Summary 37, The Invasion of Italy, pp. 82-83, in BAM [AHB].) It is interesting to note that the Germans claimed to have sunk thirty-six ships (including three cruisers and seven destroyers), probably sunk sixteen, and damaged thirty-nine. (*Ibid.*, p. 84.)

130. Military Conference Between the USA, Great Britain, and the USSR, Teheran, 29 Nov. 1943; MAC, War Room Sum., Sept. 1943; NASAF Intops Sum. 70; NATAF, Operation Avalanche; History, XII Ftr. Comd., June 1943-Jan. 1944; 12th AF, Operations of the Twelfth AF, 8 Nov. 1942-8 May 1945; Hq. 12th AF, Status Report on French Air Forces for Month of Sept. 1943, dtd. Oct. 1943; 12th AF, Operations and Statistics of Twelfth AF; NAAF Monthly Opns. Bulletin 6; NAAF Air Intel. Weekly Sums. 42-46; data from Brit. Air Ministry, through Mr. J. C. Nerney, and from Stat. Control, Hq. AAF.

131. Hq. MAAF, Close Support of the Fifth Army.

## NOTES TO CHAPTER 16

1. For the limitations imposed on NAAF during October by adverse weather, see NAAF Opnl. and Intel. Sums. 223-53; NASAF Intops Sums. 71-101; unit histories, 12th, 310th, 340th, 320th, 319th Bomb. Gps. (M), 2d Bomb. Gp. (H), 82d Fighter Gp.

2. See the unit histories of various bomber and fighter groups and squadrons, October 1943.

3. RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 46-50; NAAF Opnl. and Intel. Sums. 223-54; NASAF Intops Sums. 71-101; Air Ministry Weekly Sums. 217-22; Mare Nostrum, p. 6.

4. See n. 3.

5. Basic data on operations during the first week of October are from RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 46-47; NAAF Opnl. and Intel. Sums. 223-31; MATAF Daily Intops Sums., Oct. 1943; NASAF Intops Sums. 71-78; Brit. Hist. Sec., Central Med., Operations of British, Indian and Dominion Forces in Italy, Pt. 1, Sec. F; additional info. in files of BAM (AHB). Good data on these and many other October missions may be found in the October 1943 unit histories of the 12th, 310th, 319th, 320th, 321st, and 340th Bomb. Gps. (M), 47th Bomb. Gp. (L), and 14th, 79th, and 82d Fighter Gps.

6. CM-IN-1260, Eisenhower to AG-WAR for CCS, 3 Oct. 1943.

7. RAF Med. Review No. 5; unit histories of 310th and 321st Bomb. Gps. (M) and 14th Fighter Gp.

8. See n. 5.

9. See also unit history, 79th Fighter Gp., Oct. 1943; additional data from files of BAM (AHB).

10. Operations for the period 9 through 12 October are from RAF Med. Review No. 5; NAAF Air Intel. Weekly Sum. 48; NAAF Opnl. and Intel. Sums. 231-35; NASAF Intops Sums. 79-82.

11. Data from files of BAM (AHB).

12. History, Fifth Army, II, 15-37.

13. RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 48-49; NAAF Opnl. and Intel. Sums. 235-37; NASAF Intops Sums. 83-84.

14. Operations of Tactical, 15-22 Oct., inclusive, are from RAF Med. Review No. 5; NAAF Opnl. and Intel. Sums. 237-45; NASAF Intops Sums. 85-92; unit histories, 57th, 79th, and 82d Fighter Gps., Oct. 1943.

15. AFSSHO Special File 77 (msgs.).

16. History, 82d Fighter Gp., Oct. 1943; G-3, AFHQ, Employment of Allied Forces, 3 Oct. 1943, P/109 (final), in Operations Record Book (ORB), MAC. See

also CM-IN-3460, Air CP to Marshall for Giles sgd. Spaatz, 15 Dec. 1943. For the number of planes which were flown to Sicily, see Select Documents on Air Operations, 1940-1943, from Italian Air Ministry archives in Rome, Sec. 2, Report on Disposal of Italian Aircraft, trans. by W. M. Gould of BAM (AHB). The figure of 225 has been accepted, although Italian Air Ministry statistics put the number at 313. In addition to the 225 planes which escaped to the Allies, the Germans seized between 300 and 400 first-line planes, at least half of which were noncombat. Of the remaining 900 to 1,000 IAF planes, only about 80 were serviceable; the rest were in production, repair, or OTU or were wrecked by the Italians. (*Ibid.* See also additional data in files of BAM [AHB].)

17. RAF Med. Review No. 5; NAAF Opnl. and Intel. Sums. 245-54; NAAF, ORB, appendices; MAC War Room Monthly Sum.; transcript of tel. conversation, Gen. Wentzell and Gen. Westphal, 26 Oct. 1943, in Canadian Hist. Sec., Rpt. 18, The Campaign in Southern Italy, p. 37, in files of BAM (AHB); NASAF Intops Sums. 93-101; additional data from files of BAM (AHB).

18. NATAF, Note on the Employment of Tactical Bomber Force, sgd. E. C. Hudleston, air cdre.

19. Data on Strategic's operations during the last half of October are largely from RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 49-50; NAAF Opnl. and Intel. Sums. 237-54; NASAF Intops Sums. 85-101; Air Ministry Weekly Intel. Sums. 217-18; unit histories, 2d, 47th, 319th, 321st, 340th Bomb. Gps., 47th Bomb. Wing. Other sources are noted in subsequent footnotes.

20. File 77 (ltrs.).

21. The historian of the 42d Bombardment Wing (B-26's) claimed that the wing "led the way in the experimentation which was later to culminate in the introduction of a new philosophy of railway interdiction through the cutting of bridges." (See A History of the 42d Bomb. Wing.)

22. For the movement of mediums and fighters to Italy and Sardinia, see Administrative History, Twelfth Air Force, Pt. III, Vol. I, and unit historical material for Sept.

and Oct. of the 42d Bomb. Wing, 319th, 321st, and 340th Bomb. Gps. (M), 62d Fighter Wing, and 31st, 33d, 57th, and 82d Fighter Gps. See also History of No. 205 Gp., prep. by BAM (AHB); Minutes of Meeting at Hq. NATAF, 29 Sept. 1943, in TAF/113/ORS; Minutes of Conference B, Hq. 15th Army Gp., 12 Oct. 1943; and other docs. in files of BAM (AHB).

23. CM-OUT-13348, Marshall to Eisenhower, 29 Oct. 1943; memo for CG AAF from Gen. Kuter, 27 Oct. 1943. Subsequently, a memorandum on the subject of bridge-bombing was prepared for the President. (See memo for the President, Application of Air Power in Italy. See also Kesselring Questions, as cited in chap. 14, n. 74.)

24. File 77 (msggs.).

25. Kesselring questions.

26. History, 47th Bomb. Wing, 25 Feb.-1 Dec. 1943.

27. This was the first attack on an Albanian target by an Italy-based USAAF unit. (See History, 47th Bomb. Wing.)

28. RAF Med. Review No. 5; Enemy Merchant Vessels Sunk in the Mediterranean by Allied Aircraft, prep. by BAM (AHB); File 77 (msggs.).

29. Stat. Control; Hq. AAF, Twelfth AF, Opns. of the Twelfth AF, 8 Nov. 1942-8 May 1945; Air Ministry Weekly Sums. 215-18; MAAF Monthly Opns. Bulletin 9; History, XII Ftr. Comd., 1 June 1943-1 Jan. 1944; Mare Nostrum, pp. 6, 10. Figures taken from GAF records by the British Air Ministry indicate that NAAF's claims were substantially correct.

30. NAAF Opnl. and Intel. Sums. 245-54; History, Original XII AFSC.

31. History, 15th AF (Rev.), I, 38-39; AAFRH-21, Special Operations, AAF Aid to European Resistance Movements.

32. Hq. AAFEC/MTO (Prov.), History of Policies Affecting Aviation Engineers in the Mediterranean Campaigns, 20 Jan. 1945; History, XII AFEC (Prov.), Activation to 1 Jan. 1944.

33. See n. 32.

34. See n. 32; memo for Gen. Kuter from Col. Joe L. Loutzenheiser, 9 Nov. 1943; Hq. AAFSC/MTO, The Handling and Consumption of Aviation Gasoline in the MTO, 8 Nov. 1942-1 July 1944, p. 15.

35. History of Policies Affecting Avn.

Eng.; History, AAFSC/MTO, 1 Jan.-30 June 1944, pp. 95 ff.; Handling and Consumption of Avn. Gasoline; CM-IN-16645, Algiers to WAR, 25 Nov. 1943; Outline History, Corsica Air Sub-Area; History, Original XII AFSC; memo for Lt. Gen. F. E. Morgan from Brig. Gen. D. A. Davidson, 8 Nov. 1943; memo for Kuter from Loutzenheiser, 9 Nov. 1943; Logistical History, NATOUSA-MTOUSA, pp. 204-5.

36. Logistical History, NATOUSA-MTOUSA, p. 29; Hq. AAFSC/MTO, The History of Adriatic Depot Under AAF Control; History, AAFSC/MTO, 1 Jan.-30 June 1944, pp. 364 ff.

37. The Outline History, Corsica Air Sub-Area; History, Original XII AFSC, pp. 203 ff.

38. Air Ministry Weekly Intel. Sum. 215; Outline History, Corsica Air Sub-Area; flow chart, XII AFSC, 23 Dec. 1943; History, AAFSC/MTO, 1 Jan.-30 June 1944.

39. History, Original XII AFSC, pp. 205 ff.; History, AAFSC/MTO, 1 Jan.-30 June 1944, pp. 117-22; Logistical History, NATOUSA-MTOUSA, pp. 28-29; AFHQ Adm. Memo 80, 14 Nov. 1943; ltr., AFHQ AF 400-3 (General) GDS-AGM, Supply of Allied Forces in Corsica and Sardinia, 6 Oct. 1943.

40. Historical Data, MATS, 25 May 1943-31 May 1944; Hq. MATS GO 5, 31 Dec. 1943; MAC, ORB, Apps. 122-3, Minutes of Conferences Held at MAC, 2-3 Nov. 1943, in files of BAM (AHB).

41. CCS, 106th Mtg. (QUADRANT), 14 Aug. 1943; memo for JCS from CG AAF, To Assure the Most Effective Exploitation of the Combined Bomber Offensive, 9 Oct. 1943.

42. File 77 (msggs.).

43. CCS, 106th Mtg. (QUADRANT), 14 Aug. 1943; Meeting of JCS with President Roosevelt and Secretary Stimson, 10 Aug. 1943.

44. CM-IN-14271, Eisenhower to Marshall, 19 Sept. 1943.

45. JCS 524, 9 Oct. 1943, and App. B to same; memo sgd. S/Sgt. G. V. Martin, Thoughts on the Formation of the Fifteenth Air Force, in file of Lt. Col. James Parton, Hq. AAF (hereinafter cited as Formation of 15th AF).

46. Formation of 15th AF, citing ltr.,

Maj. Gen. I. H. Edwards to Lt. Gen. Ira C. Eaker, n.d., and other documents; memo for C/S ETOUSA from Eaker, 1 Oct. 1943.

47. CM-OUT-6433, Spaatz to Eisenhower, 14 Oct. 1943; CM-IN-7113, Doolittle and McDonald sgd. Eisenhower to Spaatz care of Arnold, 12 Oct. 1943.

48. JCS 524/1, 16 Oct. 1943; CM-OUT-6433, Spaatz to Eisenhower, 14 Oct. 1943; directive, WD to AFHQ Adv. CP, 23 Oct. 1943, in History, 15th AF (Rev.), I, 23.

49. CCS, 124th Mtg., 22 Oct. 1943; CCS 217/1, 19 Oct. 1943.

50. CM-OUT-9934, CCS to Eisenhower, 22 Oct. 1943.

51. Draft reply to FAN 254 and ltr., Lt. Gen. Ira C. Eaker to Lt. Gen. Jacob L. Devers, CG ETOUSA, 25 Oct. 1943, both quoted in Formation of 15th AF; interview with Col. C. A. Young, AC/S, A-2, 15th AF, 27 May 1944, in History, 15th AF, Vol. II; additional data from files of BAM (AHB).

52. Young interview.

53. File 77.

54. CCS, 125th Mtg., 29 Oct. 1943; CM-IN-18272, Spaatz sgd. Eisenhower to AGWAR for Arnold, 30 Oct. 1943.

55. CM-OUT-14208, Arnold to Eisenhower for Spaatz, 31 Oct. 1943. See also CCS, 125th Mtg., 29 Oct. 1943; MC-OUT-9061, Spaatz sgd. Eisenhower to AGWAR for Arnold, 30 Oct. 1943. The British Air Ministry on 31 October expressed the opinion that lack of airfields would make it impossible for additional units of heavies to be sent to Italy before January 1944 and that the last of the fifteen groups to be added to the Fifteenth could not be handled before April. (Information supplied by BAM [AHB].)

56. Adm. History, 12th AF, Vol. I, Pt. III; Hq. 12th AF GO 99, 3 Dec. 1943; History, 15th AF, Vol. I, and History, 12th AF (Rev.), I, 19-21; memo, Hq. 12th AF, 21 Dec. 1943.

57. CM-IN-3117, Eisenhower to AGWAR for Arnold, 5 Nov. 1943. See also memo for Gen. Craig from Brig. Gen. O. P. Weyland, 28 Oct. 1943; ltr., S/W to CG NATO, 30 Oct. 1943; ltr. and CM-OUT-13908, both from AGWAR to CG NATO, 30 Oct. 1943. Activation was per

Hq. NATOUSA GO 121, 1 Nov. 1943, and Hq. 12th AF GO 82, 1 Nov. 1943.

58. History, 15th AF, Vol. I; Hq. 15th AF GO's 1 and 2, 1 Nov. 1943. General Partridge became deputy commander on 5 December 1943 per Hq. 15th AF GO 16, 5 Dec. 1943.

59. History, 15th AF (Rev.), I, 46-47.

60. Hq. 15th AF SO 1, 1 Nov. 1943; CM-IN-312, AFHQ to WAR, 1 Nov. 1943 (paraphrase); CM-IN-18094, Eisenhower to AGWAR for CCS, 29 Oct. 1943; History, 15th AF (Rev.), I, 22, 41-44.

61. History, 15th AF (Rev.), I, 41-43; History, AAFEC/MTO (Prov.).

62. R&R, AC/AS, Plans to S/AS, 13 Oct. 1943, and ltr., Arnold to Eaker, 22 Oct. 1943; ltr., Col. H. P. Dellinger, Chief, Supply and Maintenance Br., AC/AS, MM&D to CG ASCPFO, 28 Oct. 1943; CM-OUT-1613 and 386, Marshall for Eisenhower, 4 Nov. and 1 Dec. 1943.

63. CM-OUT-1519, Arnold to Eisenhower for Spaatz, 3 Nov. 1943. See also CM-IN-15993, from Algiers, 21 Aug. 1943 (paraphrase) and the unit histories of the several groups.

64. Misc. doc. in WP-III-F-3 (Med.), AFAEP (n.d. or other info. on the doc.); R&R, Col. E. S. Metzel, Chief, Mil. Personnel Div. to AC/AS, OC&R, 6 Nov. 1943; R&R, Program Div., AC/AS, OC&R to Theater Commitment and Implementation Br., 22 Nov. 1943; History, 15th AF (Rev.), I, 25; Hq. 15th AF GO 31, 29 Dec. 1943.

65. History, 15th AF, Vol. I, and interview with Maj. Gen. N. F. Twining, 5 June 1944, in Vol. II; CM-OUT-10117, Giles to Arnold, 24 Nov. 1943; memo for AC/AS, OC&R from AC/S, OPD, 2 Dec. 1943, and memo for AC/AS, Plans from AC/AS, OC&R, 26 Nov. 1943; chart, NAAF Operational Control, prep. by 23d SCORU, 24 Oct. 1943; CM-OUT-12538, to Fifteenth AF, 28 Oct. 1943; memo for Gen. Craig, AC/AS, Plans from Col. J. L. Loutzenheiser, OPD, 8 Dec. 1942; CM-IN-123, Algiers to WAR, 1 Nov. 1943 (paraphrase); ltr., Arnold to Spaatz, 20 Aug. 1943; msg., AGWAR sgd. Arnold to Eisenhower for Spaatz, 6126, 1 Jan. 1944.

66. Interview with Maj. Gen. N. F. Twining, 5 June 1944, in History, 15th AF, Vol. II.

67. History, 15th AF, Vol. I; History, 15th AF (Rev.), I, 33.

68. Msg., CG XII AFSC to CO III ASAC, 11 Oct. 1943; msg., Spaatz to NAASC, 23 Oct. 1943; Hq. XII AFSCGO 57, 22 Oct. 1943; msg., Bartron to CG 12th AF, 7 Nov. 1943; msg. G47-L, sgd. Bartron, 30 Dec. 1943; History, Original XII AFSC; Hq. AAF/MTO GO's 1 and 2, Jan. 1944; History, 15th AF (Rev.), I, 77 ff.

69. History, 15th AF, Vols. I and III. The transfer of the mediums was per Hq. 12th AF GO 84, 3 Nov. 1943, and MAAF (Adv.) cable OP-452, 1 Jan. 1944, as cited in History, 15th AF, Vol. I. (See also unit history, 47th Bomb. Wing, 25 Feb.-1 Dec. 1943.)

70. History, 15th AF (Rev.), I, 24-25.

71. *Ibid.*, p. 68, table 4.

72. CCS 217/2, 5 Nov. 1943.

73. CM-IN-5620, Spaatz and Eaker sgd. Eisenhower to Arnold, 9 Nov. 1943; CM-IN-13414 and 15394, Arnold to Giles, 22 and 25 Nov. 1943; CM-OUT-361, Arnold to Eaker, 1 Dec. 1943; AC/AS, OC&R Diary, 18 Nov. 1943.

74. Ltr., CG NAAF to CG 15th AF, 14 Nov. 1943; History, 15th AF (Rev.), I, 408; CM-IN-7340, Spaatz sgd. Eisenhower to AGWAR for Arnold, 10 Nov. 1943; CCS, 131st Mtg. (SEXTANT), 26 Nov. 1943.

75. History, 15th AF, Vol. II; CCS, 131st Mtg. (SEXTANT), 26 Nov. 1943; CM-IN-7340, Spaatz sgd. Eisenhower to AGWAR for Arnold, 10 Nov. 1943; Young interview, as cited in n. 51; History, MAAF, Dec. 1943-1 Sept. 1944; History, 15th AF (Rev.), I, 306-13.

76. History, MAAF; Young interview.

77. History, MAAF; 15th AF Historical Sum., First Year of Operations, 1 Nov. 1944; History, 15th AF (Rev.), I, 312-19.

78. History, MAAF; History, 15th AF (Rev.), I, 318.

79. History, 15th AF, Vol. II.

80. *Ibid.*; CM-IN-7340, Spaatz sgd. Eisenhower to AGWAR for Arnold, 10 Nov. 1943.

81. AC/AS, Intel. to Gen. Arnold, Current Items of Air Intelligence, 11 Oct. 1943; AC/AS, Intel., Oil Installations Within Range of Italian Bases, 5 Oct. 1943.

82. CM-IN-7340, Spaatz sgd. Eisenhower to AGWAR for Arnold, 10 Nov. 1943; History, MAAF. See also, Report of

Committee of Operations Analysts, 8 Mar. 1943.

## NOTES TO CHAPTER 17

1. Air Comd. Post, Review of MAC Target Force, 2 Oct. 1943; D/CAS/E/18B, Organization and Expansion of the USAAF in the Mediterranean, 12 Jan. 1944; notes on La Marsa Conference, 24 Sept. 1943; 1910/40/G (Ed.), 15th Army Gp., 25 Sept. 1943, Col. Foster, S.D. and T.; numerous ltrs. to and from Coningham, Oct. and Nov. 1943. All documents in files of BAM (AHB).

2. Basic data for the operations of Tactical and Strategic during November come from RAF Med. Review No. 5; NAAF Air Intel. Weekly Sums. 51-55; NAAF Opnl. and Intel. Sums. 254-84; NATAF Int/Opsums 205-34; History, 15th AF, Vol. II. Additional data from files of BAM (AHB). Other sources are noted in footnotes.

3. MC-OUT-1159, Eisenhower to AGWAR for CCS, 4 Nov. 1943; British Hist. Sec., Central Med., Operations of British, Indian and Dominion Forces in Italy, Pt. 1, Sec. F.

4. Canadian Hist. Sec., Rpt. 18, The Campaign in Southern Italy, pp. 45-49 (citing captured German war diaries and transcripts of tel. conversations), in files of BAM (AHB).

5. *Ibid.*

6. See No. 242 Gp. Opnl. Instruction 19, 31 Oct. 1943.

7. See also Enemy Merchant Vessels Sunk in the Mediterranean by Allied Aircraft, prep. by BAM (AHB).

8. History, 15th AF, Vol. III.

9. To give a single example of the effect of adverse weather: in November, the 319th Bomb. Group (M) planned eighteen missions; ten of them were canceled and three more rendered abortive by the weather. (See History, 319th Bomb. Group [M], Oct. 1943. For the percentage of early returns, see History, 15th AF [Rev.], I, 179-80.)

10. History, 15th AF, Vol. II, especially interviews with Col. C. A. Young, AC/S, A-2, 15th AF, 27 May 1944, and Brig. Gen. C. F. Born, AC/S, A-3, 15th AF, 2 June 1944; History, 15th AF (Rev.), I, 402.

11. History, 15th AF, Vol. II.



12. See also memo for Gen. Arnold from Maj. Gen. B. M. Giles, C/AS.

13. AFSHO, Special File 77 (ltrs.).

14. JCS, 130th Mtg., 25 Nov. 1943.

15. Hq. MAAF, Air Power in the Med., App. C, pp. 2-3.

16. *Ibid.*

17. See also CM-IN-3205, 12th AF to WAR, 5 Nov. 1943; History, 15th AF, Vol. IV; History, 2d Bomb. Gp. (H), Nov. 1943; History, 15th AF (Rev.), I, 321.

18. See n. 17.

19. Born interview.

20. RAF Med. Review No. 5.

21. CM-OUT-2322, Arnold to Spaatz, 6 Nov. 1943.

22. Memo for Gen. Arnold from Maj. Gen. B. M. Giles, C/AS, 15 Nov. 1943.

23. Military Conference Between the USA, Great Britain, and the USSR, Teheran, 29 Nov. 1943. It also was noted that the strategic air attacks from the United Kingdom and MTO were containing about a million men in Germany for defense and repair.

24. See especially History, 15th AF, Vol. II.

25. History, 319th Bomb. Gp. (M), Nov. 1943.

26. Planes flying from Tunisia, Italy, and southern Sardinia to southern France and northern Italy frequently made the return trip with engines out, gasoline low, or with severe battle damage. On such occasions Corsica and Sardinia frequently were invaluable as emergency landing areas. (See, for example, History, 2d Bomb. Gp. [H], Nov. and Dec. 1943.)

27. CM-OUT-10388, CCS to Eisenhower, 23 Oct. 1943; FAN 256, AGWAR to ETOUSA, 24 Oct. 1943; CM-IN-6136, Spaatz sgd. Eisenhower to AGWAR for Arnold, 10 Nov. 1943; CM-IN-7993, Eisenhower to AGWAR for CCS, 13 Nov. 1943; msg., MAC to Air CP, 6 Nov. 1943, in MAC ORB, App. 119; files of BAM (AHB).

28. See also CM-OUT-5998, Sexton to Lt. Col. McCarthy for Arnold, 15 Nov. 1943; Air Ministry Weekly Intel. Sums. 221-22.

29. History, 82d Fighter Gp., Nov. 1943.

30. History, 15th AF, Vol. II. For details of nickeling operations, see AAFRH-

21, Special Operations: AAF, Aid to European Resistance Movements, 1943-45.

31. Statistics for November are based on NAAF Monthly Opn. Bulletin 8; NAAF Monthly Stat. Sum. 1; Air Ministry Weekly Intel. Sums. 219-23; History, 15th AF, Vol. III; History, XII Ftr. Comd., 1 June 1943-1 Jan. 1944.

32. The increase in air-sea rescue operations—owing to NAAF's widespread activities which now included the Adriatic, the Aegean, and the northwestern Mediterranean—caused the AAF to send Coastal a new rescue squadron of nine PBV-5's. (See CM-OUT-10425, Arnold to Spaatz, 26 Nov. 1943.)

33. CM-IN-10616, 12th AF to AGWAR, 17 Nov. 1943. Data supplied by the British Air Ministry indicate that these claims probably were too high.

34. MACAF, Mare Nostrum, pp. 8-9, 26; Air Ministry Weekly Intel. Sums. 219-23; History, XII Ftr. Comd., 1 June 1943-1 Jan. 1944. See also Preliminary Report on the "Dunnock" Attack, 11 Nov. 1943; A.C.A.S. (1), Rise and Fall of the Luftwaffe; captured German docs.; all in files of BAM (AHB).

35. NAAF Air Intel. Weekly Sum. 52. See also captured German docs. and A.C.A.S. (1), Rise and Fall of the Luftwaffe.

36. In addition to the various NAAF intel. sums., see CM-IN-5976, NAAF to AGWAR *et al.*, 9 Dec. 1943; Mare Nostrum, pp. 27-28; and the following (from the files of BAM): captured German docs.; report, Attack on Bari Harbor; msg. A262, Air CP to Air Ministry, 5 Dec. 1943; msg. 251, AOC 242 Gp. to Air CP, n.d.; msg. 9797, C.O.S. AFHQ, 5 Dec. 1943; W/T, AOC NACAF to Air CP, 4 Dec. 1943; Air Staff MACAF Form 540, Dec. 1943, App. D; War Room Monthly Sum. of MAC Operations, Dec. 1943. In addition to the Allied faults noted in the text there is some reason to believe that the defense elements around Bari had grown complacent and did not believe the Germans could mount a major raid. (See Investigation of Bari Raid file, in BAM [AHB].)

37. Ltr., Arnold to Spaatz, n.d., but definitely 3 Dec. 1943.

38. See also Mare Nostrum, p. 28; His-

tory, XII Ftr. Comd., 1 June 1943-1 Jan. 1944.

39. CM-OUT-2132, book msg., 6 Dec. 1943; Mare Nostrum, p. 28; Air Ministry Weekly Intel. Sums. 223-27; NAAF Air Intel. Weekly Sums. 55-59; data from captured German records supplied by BAM, through Mr. J. C. Nerney.

40. RAF Med. Review No. 6; NAAF Air Intel. Weekly Sums. 55-59.

41. CM-OUT-2132, NAAF to AG-WAR *et al.*, bk. msg., 6 Dec. 1943; NAAF Air Intel. Weekly Sums. 55-58; data from BAM, through Mr. J. C. Nerney.

42. Based principally upon ltr., Col. G. C. McDonald, A-2, 12th AF to Maj. Gen. Clayton Bissell, AC/AS, Intel., 16 Nov. 1943, and upon estimates in NAAF Air Intel. Weekly Sums. 51-54.

43. Order of Battle, German 10th Army, in Canadian Hist. Sec. Rpt. 18, p. 54.

44. History, Fifth Army, III, 20-47; RAF Med. Review No. 6.

45. The story of tactical and strategic operations during December is based on RAF Med. Review No. 6; NAAF Air Intel. Weekly Sums. 56-59; NATAF Int/Opsums 223-66; History, 15th AF, Vol. II; MACAF, Mare Nostrum.

46. History, 15th AF (Rev.), I, 47-51; History, AAFEC/MTO (Prov.).

47. History, 15th AF, Vol. II.

48. MAAF, A-2 Sec. Special Intel. Rpt. 64, cited in History, MAAF; Railroad Situation from January 1944 up to the Beginning of the May Offensive (Italy), report by Klaus Stange, General in Charge of Transportation, Italy, 20 Apr. 1947, trans. by WDSS-HD, Capt. F. C. Mahin and D. H. Finke.

49. MAAF Special Intel. Rpt. 64.

50. Figures for December sorties, bomb tonnage, and victories and losses are from MAAF Monthly Opns. Bulletin 9; MAAF Monthly Stat. Sum. 2; Air Ministry Weekly Intel. Sums. 224-27; History, 15th AF, Vols. II, III; RAF Med. Review No. 6; Operations of Twelfth AF, 8 Nov. 1942-8 May 1945; History, XII Ftr. Comd., 1 June 1943-1 Jan. 1944. It should be noted that NAAF's claims of enemy aircraft destroyed are so far out of line with the figures found in GAF records—which admit to only eighty planes lost to Allied action—that the difference cannot be resolved.

51. MAAF, Air Power in the Med., App. G, pp. 1-4.

52. *Ibid.*

53. MAAF, A-2 Sec. Special Intel. Rpt. 65, 26 Dec. 1943, quoted in History, MAAF.

54. Arnold to CG 15th AF, Priority POINTBLANK, 27 Dec. 1943. See also ltr., Maj. Gen. B. M. Giles, C/AS to Gen. Spaatz, 27 Dec. 1943.

55. Ltr., Giles to Spaatz, 27 Dec. 1943.

56. AFAEP Division Digest, 21 Dec. 1943.

57. History, MAAF, Vol. I; CM-IN-6253, Spaatz sgd. Eisenhower to Arnold, 9 Dec. 1943; data from Stat. Control, Hq. AAF; Administrative History, 12th AF, Pt. I, App. A; History, 15th AF (Rev.), I, 63.

58. For the training, operations, and strength of the FAF, see The French Air Force in MAAF, A Preliminary History; WP-III-F-12 (North Africa No. 2), *passim*, in AFAEP, European Br., FAF file; Weekly Report of Status of Aircraft and Combat Crews, NAAF, 23 Nov. 1943, prep. by 23d SCORU; CM-OUT-7258, Arnold to Spaatz, 18 Aug. 1943.

59. CM-OUT-6755, Arnold to Spaatz, 17 Aug. 1943; CM-IN-9007, Spaatz sgd. Eisenhower to Arnold, 11 Sept. 1943; ltr., Maj. Gen. B. M. Giles, C/AS to CG 12th AF, 8 Oct. 1943; AFAEP Div. Digest, 13 Sept. 1943; Young interview; unit histories, 376th Bomb. Gp. (H) and 512th Bomb. Sq., Nov. and Dec. 1943; AAFHS-64, Training of Foreign Nationals by the AAF, 1939-45, pp. 40-42, 196.

## NOTES TO CHAPTER 18

1. Ltr., Hq. 8th AF to CG VIII AFSC, 11 Sept. 1942; Hq. 8th AF, A-1 Periodic Rpt., July, Aug., Nov. 1942.

2. History, 8th AF, II, 20.

3. Ltr., Eaker to CG 8th AF, 24 Oct. 1942; ltr., Spaatz to Arnold, 31 Oct. 1942.

4. Hq. 8th AF A-1 Periodic Rpt., Jan. 1943.

5. Ltr., Stratmeyer to Spaatz, 30 Jan. 1943. Stratmeyer called the ETO "our marginal effort." For a discussion see Administrative and Logistical History of the ETO, Pt. III, pp. 80-84.

6. Hq. 8th AF A-1 Periodic Rpt., June 1943.

7. ETO Stat. Sum., June 1943.
8. Hq. AAF, Stat. Sum. of 8th AF Operations, 17 Aug. 1942-8 May 1945, p. 9; Office of Stat. Control, AAF Stat. Digest, Dec. 1945, p. 8.
9. Stat. Control Office, Hq. USSTAF Organization Status Rpt.; Stat. Control Office, Hq. AAF Organization Status Rpt., SC 127-9.
10. Hq. 8th AF A-1 Periodic Rpt., June 1943.
11. *Ibid.*, Nov. 1942, May, June 1943.
12. *Ibid.*; Stat. Sum., 8th AF, pp. 8-9.
13. Hq. 70th Replacement Depot, Review of Operations (UK Stations Only), 3 Mar. 1945.
14. Ltr., Hq. 8th AF to CG VIII AFSC, 15 Mar. 1943; ltr., Col. H. H. Holland, CO 12th RCD to CG VIII AFSC, 26 Apr. 1943; History, 8th AF Replacement Depot, pp. 33, 37.
15. Hq. VIII AFSC Bulletin 9, 19 Oct. 1942, p. 3; Administrative and Logistical History of the ETO, Pt. II, Vol. I, 128-30; Hq. SOS, ETOUSA Circular 44, 3 Nov. 1942.
16. 1st ind. (ltr., Hq. 8th AF to CG VIII AFSC, 7 Feb. 1943), Hq. VIII AFSC to CG 8th AF, 10 Feb. 1943; ltr., Eaker to CG 8th AF, 27 Feb. 1943; memo for CG 8th AF from CG VIII AFSC, 24 July 1942; ltr., Eaker to A/Cdre. A. C. Sharpe, RAF, 1 Feb. 1943.
17. See also ltr., Arnold to Spaatz, 14 Aug. 1942.
18. VIII BC Diary, 13 July 1942.
19. Memo for AG Cable Sec., 8th AF from A-4, 9 Feb. 1943; ltr., Eaker to Stratemyer, 12 Feb. 1943; Hq. 8th AF Memo 65-2, 2 Oct. 1942; ltr., Col. D. H. Baker, Hq. VIII AFSC to CG 8th AF, 25 Apr. 1943. For a discussion see Hq. VIII AFSC, U.S. Army Air Force Maintenance and Supply Organization, n.d. but prob. late 1943.
20. Hq. 8th AF Memo 65-2, 2 Oct. 1942; 3d ind. (ltr., CG VIII AFSC to CG 8th AF, 5 Nov. 1942), Brig. Gen. L. W. Miller to CG 8th AF, 20 Nov. 1942.
21. Ltr., Eaker to Stratemyer, 12 Feb. 1943; memo for C/S, Hq. VIII AFSC from Maintenance and Repair Div., 20 Apr. 1943; Hq. 8th AF Station Lists and Strength Rpts., 7 June 1943, pp. 2-11, 6 June 1944, pp. 4-27, *passim*.
22. Hq. 8th AF GO 23, 3 Sept. 1942;

memo for C/S VIII BC from Lt. Col. F. W. Castle, A-4, VIII BC, 13 Oct. 1942; VIII AFSC Staff Conf. Minutes, 16 Oct. 1942; ltr., Brig. Gen. N. Longfellow, CG 1st Bomb. Wing to all tactical groups, 1st Bomb. Wing, 24 Oct. 1942; Hq. VIII AFSC Memo 65-9, 27 Oct. 1942; ltr., Col. Castle to A-3, VIII BC, 22 Nov. 1942; ltr., Brig. Gen. J. M. Clark, Chief, M&R Div. to CG VIII AFSC, 13 Dec. 1942; ltr., Col. J. P. Kirkendall, Acting A-4 to CG 8th AF, 17 Dec. 1942; 3d ind. cited in n. 20; ltr., Hq. VIII AFSC to CG 8th AF, 26 Feb. 1943; Hq. VIII AFSC Memo 160-9, 25 Feb. 1943; Hq. VIII AFSC GO 4, 11 Mar. 1943; ltr., Eaker to CG SOS, 10 Apr. 1943; ltr., CG VIII AFSC to Chiefs of Hq. VIII AFSC Staff Secs. and CO's of Stations Concerned, 1 June 1943.

23. Hq. VIII AFSC Memos 160-2 (31 Aug. 1942), 160-6 (10 June 1943); ltr., Col. D. H. Baker, Chief, Plans Sec. to CG VIII AFSC, 17 Dec. 1942.

24. Ltr., Spaatz to CG SOS, 7 July 1942; ltr., Hq. SOS to CG AAF, 26 June 1942; Construction, Supply and Maintenance Problems in the United Kingdom, n.s., n.d. but prob. 1943.

25. History, Engineer Sec., 8th AF and VIII AFSC, 23 Apr. to 31 Dec. 1942, pp. 1-2.

26. Minutes of a Meeting between ACM Portal, Gen. Spaatz and Gen. Eaker at 4:05 P.M. Nov. 28, 1942.

27. Notes on confs., Gens. Spaatz, Eaker, and Doolittle, 21, 24-25 Dec. 1942; ltr., Col. S. W. Towle, C/S, VIII FC to CG 8th AF, 10 Dec. 1942; ltr., Eaker to Portal, 9 Jan. 1943.

28. Ltr., Office of Chief Engineer, SOS to Under Sec. of State, Air Ministry, 18 Nov. 1942; ltr., Eaker to CG 8th AF, 22 Nov. 1942.

29. Ltr., Hq. VIII BC to CG 8th AF, 5 Sept. 1942; ltr., Col. Castle to A-3, VIII BC, n.d. but prob. Oct. 1942; memo for CG 8th AF from Col. Kirkendall, 17 Apr. 1942; History, Engineer Sec., 8th AF and VIII AFSC, 1 Jan. to 31 Dec. 1943, pp. 2-3.

30. Ltr., Eaker to CG ETOUSA, n.d. but prob. Apr. 1943.

31. Eighth Air Force Construction Program, 25 Mar. 1943, as amended 1 May 1943.

32. Hq. 8th AF, U.S.A.A.F. Stations in United Kingdom (photographic album);

Report of Lt. Gen. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942 to Dec. 31, 1943 (hereinafter cited as Eaker Rpt.), p. 3.

33. Ltr., Hq. 8th AF to Under Sec. of State for Air, Air Ministry, 26 Mar. 1943.

34. Eighth Air Force Construction Program, 1 Aug. 1943.

35. Construction Program, USAAFUK, 15 Nov. 1943, as amended 1 Jan. 1944.

36. *Ibid.*; Eighth Air Force Construction Program, 1 Aug. 1943.

37. Ltr., CG 8th AF to Under Sec. of State for Air (DDOP), Air Ministry, 15 Apr. 1943.

38. Ltr., Hq. 8th AF to CG VIII AFSC, 14 May 1943; ltr., Col. H. H. Holland, CO 12th RCD to CG VIII AFSC, 28 June 1943.

39. History, Hq. VIII AFSC Supply Div., 1942-43, Organization of the Supply Div., pp. 4-6.

40. Hq. SOS GO 2, 17 June 1942; memo for Chairman, General Purchasing, ETOUSA from Maj. G. A. Spiegelberg, Recorder of General Purchasing Board, Sept. 1942; ltr., Lee to CG VIII AFSC, 22 Sept. 1942.

41. Ltr., Col. Wayne R. Allen, SOS to Cols. L. C. Dill and Kirkendall, Hq. VIII AFSC, 31 July 1942; memo for CG VIII AFSC from Col. Dill, 31 Aug. 1942; History, QM Sec., Hq. USAAF in UK, 8th AF, and VIII AFSC, pp. 1-2.

42. AFSHO Special File 77 (ltrs.); Msg. R4702, Arnold to Maj. Gen. R. P. Hartle, Hq. ETOUSA, 29 Dec. 1942.

43. Minutes of a [Joint] Conference Held in Room 271, Adastral House on October 2nd 1942; Minutes of a [Joint] Meeting Held at Stafford on November 18th 1942; memo for C/S Hq. VIII AFSC from Supply Div., 20 Apr. 1943; Hq. VIII AFSC Memo 65-12, 18 May 1943.

44. Memo for Asst. Chief from Col. M. R. Wood, Chief, Supply Div., Hq. VIII AFSC, 19 Apr. 1943; ltr., Lt. Col. K. Collins, Chief, Procurement Br., Supply Div. to Chief, Supply Div., 22 May 1943; VIII BC Signal Sec., Commander's Rpt., Mar.-June 1943, *passim*.

45. Ltr., Col. D. H. Baker to CG 8th AF, 15 Apr. 1943, p. 3; History of Signal Section, Eighth Air Force and Service Command, 1942-43, pp. 4-8, 10-12; Narrative Rpt., Medical Dept. Activities, 8th

AF, 1942-43, pp. 10-11; History of the Chemical Sec., 8th AF and VIII AFSC, 21 Apr.-31 Dec. 1943, pp. 19, 22-25.

46. Minutes of Meeting Held at WIDE-WING, Bushy Park, on Tuesday, 28 July 1942; memo for Arnold from Brig. Gen. T. J. Hanley, Jr., DC/AS, 30 Apr. 1943; memo for Asst. Chief, Supply Div., Hq. VIII AFSC from Col. Wood, 19 Apr. 1943.

47. Memo for C/S, Hq. VIII AFSC from Wood, 20 Apr. 1943.

48. Progress Div., Hq. SOS, ETO Stat. Sum. LVIII, 30 Aug. 1943, pp. 23-24.

49. Ltrs., Col. Collins to Chief, Supply Div., 1 Mar., 30 Sept. 1943; History of Procurement from the British, p. 5, in History, VIII AFSC Supply Div., 1942-43. The British side of the story may be found in HMSO (London), Mutual Aid, Third Rpt., Oct. 1946.

50. Ltr., Col. Collins to Chief, Supply Div., Hq. VIII AFSC, 4 Jan. 1944.

51. See sources in n. 49.

52. Memo for C/S 8th AF from Col. Kirkendall, 21 Dec. 1942; History, VIII AFSC Supply Div., 1942-43, Supply System, p. 1. For a discussion, see Hq. ATSC, Estimating Requirements for AAF Equipment, Supplies, and Spare Parts, Jan. 1946, Pt. I, pp. 89-90. An additional factor causing unbalance of supplies in overseas theaters was the effort of the Transportation Corps to make a showing in loading ships without regard to the types of supplies. (See memo for C/S SOS from Maj. Gen. LeRoy Lutes, AC/S for Opns., SOS, 5 Mar. 1943.)

53. History, VIII AFSC Supply Div., 1942-43, Supply System, pp. 1-2.

54. *Ibid.* For a discussion, see AMC, AAF Supply of the Overseas Air Forces, Aug. 1946, pp. 21-25.

55. History, VIII AFSC Supply Div., 1942-43, Supply System, p. 5.

56. *Ibid.*, Organization of the Supply Div., pp. 3-5.

57. Hq. VIII AFSC Reg. 65-1, 25 July 1942. The procedure outlined in this regulation was actually followed.

58. Ltr., Col. Castle to C/S VIII BC, 13 Oct. 1942; Hq. VIII AFSC Memo 65-12, 12 Feb. 1943.

59. Memo for Eaker from Kirkendall, 11 Feb. 1943; ltr., Eaker to Stratemyer, 2 Mar. 1943; ASF, The Problem of Troop

and Cargo Flow in Preparing the European Invasion, 1943-44, pp. 2-6; Administrative and Logistical History of the ETO, Pt. III, pp. 78-79, 140-42, 170; unsigned memo for ASF, 25 May 1943.

60. Hq. SOS, ETOUSA, Transportation Corps Semi-Monthly Progress Rpt., 31 Mar. 1944, table 4.

61. Ltr., CG SOS to CG ETO, 17 Dec. 1942; memo for Col. E. P. Mechling, A-4 Sec., Hq. 8th AF from Kirkendall, n.d. but Jan. 1943; 1st ind. (ltr., CG SOS to CG 8th AF, 30 Dec. 1942), Hq. 8th AF to CG SOS, 12 Jan. 1943; memo for CG 8th AF from CG SOS, 20 Apr. 1943; ltr., Hq. ETOUSA to CG 8th AF, 3 July 1943; The Problem of Troop and Cargo Flow, p. 154.

62. Ltr., Capt. Fred Thomas to Chief of Air Force Sec., Wright Field, Ohio, 15 Aug. 1942; Hq. VIII AFSC Bulletin 43, 29 Mar. 1943, p. 4; Hq. VIII AFSC Weekly Activity Rpt., 3 Apr. 1943, p. 3; memo for C/S 8th AF from Kirkendall, 11 Apr. 1943.

63. Msg., Marshall to Eisenhower, 23 July 1942; ltr., CG AAF to CG ETOUSA, 10 Aug. 1942.

64. The European Wing, ATC was activated by European Wing, ATC GO 1, 14 Jan. 1943. (A History of the European Wing [ATC] from early 1943 to D-day 1944, pp. 1-2, 25-26.)

65. Memo for C/S 8th AF from Kirkendall, 21 Apr. 1943; msg. 4037, Maj. Gen. W. H. Frank, CG ASC to Maj. Gen. H. J. F. Miller, 25 Apr. 1943.

66. Hq. ETOUSA GO 56, 27 Aug. 1943; memo for Supply Div., Hq. VIII AFSC from Transportation Sec., item 2, 3 Nov. 1943; History, European Wing (ATC), pp. 28-29, 57-58.

67. Memo for Eaker from Kirkendall, 11 Feb. 1943; Eaker Rpt., App. D, p. 3; History, VIII AFSC Supply Div., Intransit Depots, pp. 1-2; VIII AFSC Staff Conf. Minutes, 5 Dec. 1942, 13 Jan. 1943; Notes on Burtonwood Air Depot Visit by Maj. A. A. Tappan and W. P. Munsell, Air Technical Sec., Hq. ETOUSA, 10 Dec. 1942.

68. Hq. VIII AFSC Memo 65-14, 20 Apr. 1943.

69. History, Ordnance Sec., Hq. VIII AFSC, 1942-43, pp. 15, 18.

70. History, Chemical Sec., cited in n.

45, pp. 18-19, 20-21; Narrative Rpt., Medical Dept. Activities, 8th AF, 1942-43, pp. 9-10.

71. Stat. Control Div., Hq. AAF Rpt. SC-SS-1989, 14 Aug. 1947.

72. *Ibid.*; ltr., CG 8th AF to CG VIII AFSC, 18 Apr. 1943.

73. Ltr., Brig. Gen. L. W. Miller, C/S VIII AFSC to Air Council, Air Ministry, 13 Oct. 1942; Hq. VIII AFSC Memo 65-16, 10 May 1943; memo (and incl.) for Col. J. F. Whitely, A-4, 8th AF from Lt. Col. B. F. Johnson, Petroleum Sec., Supply Div., Hq. VIII AFSC, 17 Aug. 1943; ltr., Col. E. E. Aldrin to CG VIII AFSC, 10 Oct. 1942; General Info. Memo-Petroleum Products-ETOUSA, by Col. C. G. Irish, Deputy Area Petroleum Officer, ETOUSA, 28 Aug. 1943; Aviation Fuel-Pertinent Statistics, chart I, 5 Nov. 1943; USFET General Board Rpt. 128, pp. 23-25; History, VIII AFSC Supply Div., Petroleum Sec., 1942-43, pp. 14-15.

74. USFET General Board Rpt. 128, pp. 23-25.

75. Hq. VIII AFSC GO's 31 (4 Nov. 1942), 10 (15 Apr. 1943); memo for Staff Secs., Hq. VIII AFSC from CG VIII AFSC, 21 Nov. 1942; History and Development of the Combat Support Wing (Prov.), 31 Dec. 1943, pp. 2-4; Notes on Staff Conf., Hq. SOS, ETOUSA, 3 May 1943.

76. Memo for CG VIII AFSC from A-3, 7 Aug. 1942; Hq. VIII AFSC GO's 26 (1 Oct. 1942), 10 (15 Apr. 1943); memo, Plans and Statistics Sec., Hq. VIII AFSC, 13 Jan. 1943; History, 27th Air Transport Group, 1942-43, pp. 4, 7-8.

77. 1st ind. (ltr., Hq. VIII AFSC to CG 8th AF, 17 Sept. 1942), Hq. 8th AF to CG VIII AFSC, 19 Sept. 1942; ltrs., Eaker to CG 8th AF, 24 Oct., 1 Nov. 1942; Hq. VIII AFSC Bulletins 10 (25 Oct. 1942, p. 3), 42-14 (21 Nov. 1942, p. 2); Minutes of Meeting Held in Col. C. L. Booth's Office, 8 Nov. 1942; History, VIII AFSC Supply Div., 1942-43, Supplies to 12th AF; memo for Eaker from Kirkendall, 11 Feb. 1943, p. 2. A memo for Chief of Ordnance, XII AFSC from Maj. L. W. Light, 9 Nov. 1942, mentions equipment shortages of Twelfth Air Force units at time of departure from England.

78. Administrative and Logistical History of the ETO, Pt. II, Vol. I, pp. 162-64;

Notes on Staff Conf., Hq. SOS, ETO-USA, 7 Dec. 1942, p. 1.

79. Ltr., Brig. Gen. L. W. Miller, CG VIII AFSC to CO Ferry and Transport Service, VIII AFSC, 2 Dec. 1942; ltr., Col. A. J. Pierce, CO FTS to Signal Officer, VIII AFSC, 28 Jan. 1943; ltr., Pierce to CG VIII FC, 5 Feb. 1943; ltr., CG VIII AFSC to CG 8th AF, 9 June 1943; Conferences, Spaatz, Eaker, and Doolittle, 21, 24-25 Dec. 1942, p. 1; msg. R6015, AGWAR to ETO, 20 Feb. 1943.

80. Digest of a [Joint] Conference Held in the Conference Room at Park House, 31 Oct. 1942, p. 1.

81. Msg. R5938, Marshall to Andrews, 17 Feb. 1943.

82. Ltr., Eaker to CG 8th AF, 16 Sept. 1942; ltr., Castle to A-3, VIII BC, n.d. but Oct. 1942, p. 2; VIII AFSC Staff Conf. Minutes, 29 Dec. 1942; ltr., Capt. E. B. Cunningham, M&R Div. to Chief, Supply Div., Hq. VIII AFSC, 17 Oct. 1942.

83. Ltr., Eaker to CG 8th AF, 16 Sept. 1942; ltr., Castle to A-3, VIII BC, Oct. 1942; memo for Dir. of Bomb. from Col. F. L. Anderson, 31 Jan. 1943; 1st ind. (ltr., CG ASC to CG 8th AF, 15 Feb. 1943), CG 8th AF to CG ASC, 14 Apr. 1943, with 1 incl.; ltr., Col. D. H. Baker, Acting C/S VIII AFSC to CG 8th AF, 15 Apr. 1943.

84. Memo for C/S VIII AFSC from Supply Div., 20 Apr. 1943.

85. Memo for C/S VIII BC from Castle, 25 Apr. 1943; memo for C/S 8th AF from A-4, 15 Mar. 1943.

86. Hq. VIII AFSC Weekly Activity Rpt., 3 July 1943, p. 5.

87. Ltr., Frank to Eaker, 7 July 1943; History, VIII AFSC Supply Div., 1942-43, Organizational Equipment, pp. 1-2; Troop and Cargo Flow, cited in n. 59, pp. 82, 147-53; ltr., Hq. 8th AF to CG SOS, 14 Oct. 1943; ltr., AGO to CG's, ETO, NYPE, and Chiefs of Technical Services, 16 May 1943.

88. Memo for C/S VIII AFSC from Supply Div., 20 Apr. 1943; memo for C/S 8th AF from A-4, 14 Mar. 1943; ltr., Col. Baker to CG 8th AF, 15 Apr. 1943, p. 3; draft of ltr. from Eaker to McNarney, May 1943, p. 9; ltr., Col. Kirkendall, Exec., Supply Div. to Chief, Supply Div., Hq. VIII AFSC, 12 Nov. 1943; Rpt. of IG, 8th AF, 23 Nov. 1942, Pt. IV; memo for Col.

Baker, Chief, Plans Sec., VIII AFSC from Maj. W. Wheelock, 7 Jan. 1943.

89. History, Ordnance Sec., Hq. VIII AFSC, 1942-43, p. 16.

90. Ltr., Eaker to Arnold, 12 Apr. 1943.

91. VIII AFSC Staff Conf. Minutes, 5 Aug. 1942; Hq. VIII AFSC Memo 70-7, 25 Sept. 1942; ltr., Engineering Officer, AAF Station 590 to Brig. Gen. J. M. Clark, Chief, M&R Div., Hq. VIII AFSC, 29 Nov. 1943; memo for C/S VIII AFSC from M&R Div., 20 Apr. 1943.

92. Hq. VIII AFSC Memo 70-7, 25 Sept. 1942.

93. Memo for Chief, M&R Div., Hq. VIII AFSC from Capt. J. C. Bach, 4 Dec. 1942; memos for Lt. Col. G. W. Noland, M&R Div., Hq. VIII AFSC from D. M. Cushman, 30 Mar., 14 Apr. 1943; memo for Lt. Col. T. M. Imlay, Hq. VIII BC from Castle, 20 Feb. 1943, pp. 1-2; memo for Longfellow from Castle, 10 Mar. 1943; ltrs., Longfellow to CG 8th AF, 8 Feb., 1 May 1943.

94. Ltr., Longfellow to CG 8th AF, 1 May 1943.

95. Memo for Col. Baker, Hq. VIII AFSC from Wheelock, 7 Jan. 1943; Rpt. of IG, 8th AF, 23 Nov. 1943, Pt. IV; ltr., Maj. Gen. H. J. F. Miller to CG 8th AF, 26 July 1943.

96. Memo, prob. from Col. J. S. Griffith, M&R Div., Hq. VIII AFSC, n.d. but prob. Nov. 1942; memo for Col. M. R. Wood, Chief, Supply Div. from Brig. Gen. J. M. Clark, Chief, M&R Div., Hq. VIII AFSC, 7 Jan. 1943.

97. Memo for Chief, Supply Div., Hq. VIII AFSC from Col. Kirkendall, Exec., 12 Nov. 1942; memo for Chief, M&R Div., Hq. VIII AFSC from Capt. J. E. Bach, 4 Dec. 1942; Conf. on Maintenance, 23 Nov. 1942 (attended by Eaker, L. W. Miller, J. M. Clark); ltr., Col. Castle to Lt. Col. Imlay, 20 Feb. 1943, pp. 1-2; rpt., Visit to Air Support Command by Lt. Col. E. W. Starr, Jr., n.d. but prob. Mar. 1943.

98. Rpt. of IG, 8th AF, 23 Nov. 1943, Pt. IV; 2d wrapper ind. (to same rpt.), Chief, M&R Div. to CG VIII AFSC, 15 Dec. 1942, p. 2; memos from Cushman cited in n. 93; 8th AF Commanders' Mtg., 7 June 1943.

99. Conf. on Maintenance cited in n. 97; memo for CG 8th AF from Col. Kirkendall, 17 Dec. 1942; ltr., Col. B. E. Beaman,



and Cargo Flow in Preparing the European Invasion, 1943-44, pp. 2-6; Administrative and Logistical History of the ETO, Pt. III, pp. 78-79, 140-42, 170; unsigned memo for ASF, 25 May 1943.

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61. Ltr., CG SOS to CG ETO, 17 Dec. 1942; memo for Col. E. P. Mechling, A-4 Sec., Hq. 8th AF from Kirkendall, n.d. but Jan. 1943; 1st ind. (ltr., CG SOS to CG 8th AF, 30 Dec. 1942), Hq. 8th AF to CG SOS, 12 Jan. 1943; memo for CG 8th AF from CG SOS, 20 Apr. 1943; ltr., Hq. ETOUSA to CG 8th AF, 3 July 1943; The Problem of Troop and Cargo Flow, p. 154.

62. Ltr., Capt. Fred Thomas to Chief of Air Force Sec., Wright Field, Ohio, 15 Aug. 1942; Hq. VIII AFSC Bulletin 43, 29 Mar. 1943, p. 4; Hq. VIII AFSC Weekly Activity Rpt., 3 Apr. 1943, p. 3; memo for C/S 8th AF from Kirkendall, 11 Apr. 1943.

63. Msg., Marshall to Eisenhower, 23 July 1942; ltr., CG AAF to CG ETOUSA, 10 Aug. 1942.

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65. Memo for C/S 8th AF from Kirkendall, 21 Apr. 1943; msg. 4037, Maj. Gen. W. H. Frank, CG ASC to Maj. Gen. H. J. F. Miller, 25 Apr. 1943.

66. Hq. ETOUSA GO 56, 27 Aug. 1943; memo for Supply Div., Hq. VIII AFSC from Transportation Sec., item 2, 3 Nov. 1943; History, European Wing (ATC), pp. 28-29, 57-58.

67. Memo for Eaker from Kirkendall, 11 Feb. 1943; Eaker Rpt., App. D, p. 3; History, VIII AFSC Supply Div., Intransit Depots, pp. 1-2; VIII AFSC Staff Conf. Minutes, 5 Dec. 1942, 13 Jan. 1943; Notes on Burtonwood Air Depot Visit by Maj. A. A. Tappan and W. P. Munsell, Air Technical Sec., Hq. ETOUSA, 10 Dec. 1942.

68. Hq. VIII AFSC Memo 65-14, 20 Apr. 1943.

69. History, Ordnance Sec., Hq. VIII AFSC, 1942-43, pp. 15, 18.

70. History, Chemical Sec., cited in n.

45, pp. 18-19, 20-21; Narrative Rpt., Medical Dept. Activities, 8th AF, 1942-43, pp. 9-10.

71. Stat. Control Div., Hq. AAF Rpt. SC-SS-1989, 14 Aug. 1947.

72. *Ibid.*; ltr., CG 8th AF to CG VIII AFSC, 18 Apr. 1943.

73. Ltr., Brig. Gen. L. W. Miller, C/S VIII AFSC to Air Council, Air Ministry, 13 Oct. 1942; Hq. VIII AFSC Memo 65-16, 10 May 1943; memo (and incl.) for Col. J. F. Whitely, A-4, 8th AF from Lt. Col. B. F. Johnson, Petroleum Sec., Supply Div., Hq. VIII AFSC, 17 Aug. 1943; ltr., Col. E. E. Aldrin to CG VIII AFSC, 10 Oct. 1942; General Info. Memo-Petroleum Products-ETOUSA, by Col. C. G. Irish, Deputy Area Petroleum Officer, ETOUSA, 28 Aug. 1943; Aviation Fuel-Pertinent Statistics, chart I, 5 Nov. 1943; USFET General Board Rpt. 128, pp. 23-25; History, VIII AFSC Supply Div., Petroleum Sec., 1942-43, pp. 14-15.

74. USFET General Board Rpt. 128, pp. 23-25.

75. Hq. VIII AFSC GO's 31 (4 Nov. 1942), 10 (15 Apr. 1943); memo for Staff Secs., Hq. VIII AFSC from CG VIII AFSC, 21 Nov. 1942; History and Development of the Combat Support Wing (Prov.), 31 Dec. 1943, pp. 2-4; Notes on Staff Conf., Hq. SOS, ETOUSA, 3 May 1943.

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77. 1st ind. (ltr., Hq. VIII AFSC to CG 8th AF, 17 Sept. 1942), Hq. 8th AF to CG VIII AFSC, 19 Sept. 1942; ltrs., Eaker to CG 8th AF, 24 Oct., 1 Nov. 1942; Hq. VIII AFSC Bulletins 10 (25 Oct. 1942, p. 3), 42-14 (21 Nov. 1942, p. 2); Minutes of Meeting Held in Col. C. L. Booth's Office, 8 Nov. 1942; History, VIII AFSC Supply Div., 1942-43, Supplies to 12th AF; memo for Eaker from Kirkendall, 11 Feb. 1943, p. 2. A memo for Chief of Ordnance, XII AFSC from Maj. L. W. Light, 9 Nov. 1942, mentions equipment shortages of Twelfth Air Force units at time of departure from England.

78. Administrative and Logistical History of the ETO, Pt. II, Vol. I, pp. 162-64;

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79. Ltr., Brig. Gen. L. W. Miller, CG VIII AFSC to CO Ferry and Transport Service, VIII AFSC, 2 Dec. 1942; ltr., Col. A. J. Pierce, CO FTS to Signal Officer, VIII AFSC, 28 Jan. 1943; ltr., Pierce to CG VIII FC, 5 Feb. 1943; ltr., CG VIII AFSC to CG 8th AF, 9 June 1943; Conferences, Spaatz, Eaker, and Doolittle, 21, 24-25 Dec. 1942, p. 1; msg. R6015, AGWAR to ETO, 20 Feb. 1943.

80. Digest of a [Joint] Conference Held in the Conference Room at Park House, 31 Oct. 1942, p. 1.

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82. Ltr., Eaker to CG 8th AF, 16 Sept. 1942; ltr., Castle to A-3, VIII BC, n.d. but Oct. 1942, p. 2; VIII AFSC Staff Conf. Minutes, 29 Dec. 1942; ltr., Capt. E. B. Cunningham, M&R Div. to Chief, Supply Div., Hq. VIII AFSC, 17 Oct. 1942.

83. Ltr., Eaker to CG 8th AF, 16 Sept. 1942; ltr., Castle to A-3, VIII BC, Oct. 1942; memo for Dir. of Bomb. from Col. F. L. Anderson, 31 Jan. 1943; 1st ind. (ltr., CG ASC to CG 8th AF, 15 Feb. 1943), CG 8th AF to CG ASC, 14 Apr. 1943, with 1 incl.; ltr., Col. D. H. Baker, Acting C/S VIII AFSC to CG 8th AF, 15 Apr. 1943.

84. Memo for C/S VIII AFSC from Supply Div., 20 Apr. 1943.

85. Memo for C/S VIII BC from Castle, 25 Apr. 1943; memo for C/S 8th AF from A-4, 15 Mar. 1943.

86. Hq. VIII AFSC Weekly Activity Rpt., 3 July 1943, p. 5.

87. Ltr., Frank to Eaker, 7 July 1943; History, VIII AFSC Supply Div., 1942-43, Organizational Equipment, pp. 1-2; Troop and Cargo Flow, cited in n. 59, pp. 82, 147-53; ltr., Hq. 8th AF to CG SOS, 14 Oct. 1943; ltr., AGO to CG's, ETO, NYPE, and Chiefs of Technical Services, 16 May 1943.

88. Memo for C/S VIII AFSC from Supply Div., 20 Apr. 1943; memo for C/S 8th AF from A-4, 14 Mar. 1943; ltr., Col. Baker to CG 8th AF, 15 Apr. 1943, p. 3; draft of ltr. from Eaker to McNarney, May 1943, p. 9; ltr., Col. Kirkendall, Exec., Supply Div. to Chief, Supply Div., Hq. VIII AFSC, 12 Nov. 1943; Rpt. of IG, 8th AF, 23 Nov. 1942, Pt. IV; memo for Col.

Baker, Chief, Plans Sec., VIII AFSC from Maj. W. Wheelock, 7 Jan. 1943.

89. History, Ordnance Sec., Hq. VIII AFSC, 1942-43, p. 16.

90. Ltr., Eaker to Arnold, 12 Apr. 1943.

91. VIII AFSC Staff Conf. Minutes, 5 Aug. 1942; Hq. VIII AFSC Memo 70-7, 25 Sept. 1942; ltr., Engineering Officer, AAF Station 590 to Brig. Gen. J. M. Clark, Chief, M&R Div., Hq. VIII AFSC, 29 Nov. 1943; memo for C/S VIII AFSC from M&R Div., 20 Apr. 1943.

92. Hq. VIII AFSC Memo 70-7, 25 Sept. 1942.

93. Memo for Chief, M&R Div., Hq. VIII AFSC from Capt. J. C. Bach, 4 Dec. 1942; memos for Lt. Col. G. W. Noland, M&R Div., Hq. VIII AFSC from D. M. Cushman, 30 Mar., 14 Apr. 1943; memo for Lt. Col. T. M. Imlay, Hq. VIII BC from Castle, 20 Feb. 1943, pp. 1-2; memo for Longfellow from Castle, 10 Mar. 1943; ltrs., Longfellow to CG 8th AF, 8 Feb., 1 May 1943.

94. Ltr., Longfellow to CG 8th AF, 1 May 1943.

95. Memo for Col. Baker, Hq. VIII AFSC from Wheelock, 7 Jan. 1943; Rpt. of IG, 8th AF, 23 Nov. 1943, Pt. IV; ltr., Maj. Gen. H. J. F. Miller to CG 8th AF, 26 July 1943.

96. Memo, prob. from Col. J. S. Griffith, M&R Div., Hq. VIII AFSC, n.d. but prob. Nov. 1942; memo for Col. M. R. Wood, Chief, Supply Div. from Brig. Gen. J. M. Clark, Chief, M&R Div., Hq. VIII AFSC, 7 Jan. 1943.

97. Memo for Chief, Supply Div., Hq. VIII AFSC from Col. Kirkendall, Exec., 12 Nov. 1942; memo for Chief, M&R Div., Hq. VIII AFSC from Capt. J. E. Bach, 4 Dec. 1942; Conf. on Maintenance, 23 Nov. 1942 (attended by Eaker, L. W. Miller, J. M. Clark); ltr., Col. Castle to Lt. Col. Imlay, 20 Feb. 1943, pp. 1-2; rpt., Visit to Air Support Command by Lt. Col. E. W. Starr, Jr., n.d. but prob. Mar. 1943.

98. Rpt. of IG, 8th AF, 23 Nov. 1943, Pt. IV; 2d wrapper ind. (to same rpt.), Chief, M&R Div. to CG VIII AFSC, 15 Dec. 1942, p. 2; memos from Cushman cited in n. 93; 8th AF Commanders' Mrg., 7 June 1943.

99. Conf. on Maintenance cited in n. 97; memo for CG 8th AF from Col. Kirken-dall, 17 Dec. 1942; ltr., Col. B. E. Beaman,

Exec. Officer, 1st Bomb. Wing to CG VIII BC, 31 Jan. 1943; ltr., Gen. Longfellow to CG 8th AF, 8 Feb. 1943.

100. Ltr., Col. Castle to Lt. Col. Imlay, Hq. VIII BC, 20 Feb. 1943; ltr., Maj. Gen. Virgil Peterson, IG, U.S. Army to DC/S, WD, 5 Aug. 1943; unsigned memo for Dir. of Maintenance, Hq. ASC-USSTAF, History of Maintenance, 31 Mar. 1944.

101. Conf. on Maintenance cited in n. 97; memo for Maj. D. K. Kirkpatrick, M&R Div., Hq. VIII AFSC from Lt. E. N. Hall, 28 Nov. 1942; Proceedings of a Board of Officers Appointed under Par. 4, SO 160, Hq. 8th AF, 27 Nov. 1942; memo for C/S, VIII BC from Col. Castle, 14 Mar. 1943.

102. Memo for Chief, M&R Div., Hq. VIII AFSC from Col. J. S. Griffith, 26 Oct. 1942; ltr., Spaatz to Arnold, 10 Nov. 1942; Rpt. of IG, 8th AF, 23 Nov. 1942, Pt. IV; ltr., Eaker to Stratemeyer, 19 Feb. 1943.

103. Memo for A-3, Hq. VIII BC from Col. Castle, 22 Nov. 1942; ltr., Col. Kirkendall to CG 8th AF, 17 Dec. 1942; ltr., Col. Baker to CG VIII AFSC, 17 Dec. 1942; ltr., Eaker to Arnold, 12 Apr. 1943. See histories of strategic depots.

104. Conf. on Maintenance cited in n. 97.

105. Hist. Journal of AAF Station 127 (2d SAD), p. 12.

106. *Ibid.*, pp. 9, 12-13; Notes for Col. John Griffith on Technical Difficulties Being Experienced in This Theater, by Lt. Col. D. K. Kirkpatrick, Maintenance Div., Hq. VIII AFSC, 13 Apr. 1943; memo for Col. Kirkendall from Lt. Col. C. A. Jones, 28 May 1943; Outline of History, 1st SAD, *passim*; ltr., Col. A. W. Martenstein, CO Advanced Air Service to CG VIII AFSC, 1 June 1943.

107. Memo for CG VIII AFSC from Gen. Clark, 13 Dec. 1942; memo for Gen. Longfellow from Col. Castle, 10 Mar. 1942; Lockheed Overseas Corp. Annual Rpt., July 1, 1942-July 1, 1943 (hereinafter cited as Lockheed Rpt.), V, Service, Salvage, and Mobile Units.

108. Lockheed Rpt.; History, VIII AFSC, chap. v, pp. 132-33; ltrs., Col. A. W. Martenstein, CO Advanced Air Service to CG VIII AFSC, 1, 16 June, 1 July 1943.

109. Ltr., Miller to Stratemeyer, 20 Mar. 1943; memo for C/S, 8th AF from

Col. Kirkendall, 11 Apr. 1943; memo for Kirkendall from Col. Beasley, 13 May 1943; memo for C/S, 8th AF from A-4, 8 June 1943.

110. Ltr., Eaker to CG ETOUSA, 5 Apr. 1943, and 1st ind., CG ETOUSA to CG 8th AF, 15 Apr. 1943; R&R, Maj. Gen. O. P. Echols, AC/AS, MM&D to C/AS, Hq. AAF, 11 May 1943; memo for Lovett from Arnold, 5 July 1943.

111. Memo for Maj. Gen. H. J. F. Miller from Gen. Clark, 29 Jan. 1943; Lockheed Rpt., Production Dept., *passim*, Industrial Relations, p. 3.

112. Ltr., Gen. Clark to Maj. Gen. H. J. F. Miller, 8 Dec. 1942; Notes on Burtonwood Air Depot Visit cited in n. 67. For a full discussion of the American civil service detachment, see History, USSTAF, III, chap. ii, 136-46.

113. See sources in n. 112. Notes of a [Joint] Meeting Held in Lord Burghley's Room at 3:30 P.M. on 5th January, 1943 (MAP); memo for Lt. Col. G. W. Noland, M&R Div., Hq. VIII AFSC from Capt. J. L. Saunders, 27 Apr. 1943.

114. Notes on Burtonwood Air Depot Visit cited in n. 67; unsigned memo, Burtonwood Air Depot, 5 Sept. 1943.

115. Msg. USFOR 282, Eaker to Stratemeyer, 10 Feb. 1943; draft of ltr., Eaker to McNarney, May 1943, pp. 7-8; File 77.

116. Memo for A-4, 8th AF from Plans Sec., Hq. VIII AFSC, 6 Feb. 1943; ltr., Col. J. S. Griffith, Chief, Maintenance Div., Hq. VIII AFSC to CO BADA, 9 Aug. 1943; Maintenance Div., Hq. VIII AFSC, Notes on Assembly, n.d. but prob. late 1943, pp. 1-3.

117. Ltr., Hq. 8th AF to CG ETOUSA, 6 Mar. 1943; Notes of a [Joint] Conference Held 30.3.43 to Consider the Salvage of U.S.A.A.F. Aircraft in United Kingdom; memo, Maintenance Div., Hq. VIII AFSC, Salvage of U.S. Aircraft, n.d. but prob. Feb. 1944; ASC-USSTAF Meeting 167, 20 Mar. 1944.

118. History, AAF Materiel Comd., 1942, pp. 40-44.

119. Eaker Rpt., p. 11.

120. Hq. VIII AFSC Memo 160-5, 12 Sept. 1942.

121. Ltr., Col. R. T. Zane, G-4, Hq. VIII AFSC to Plans Sec., 31 July 1942; VIII AFSC Staff Conf. Minutes, 22 Oct. 1942; Hq. VIII AFSC Bulletin 42-18, 19 Dec.

1942, p. 2; Lockheed Rpt.; memo on modification, n.s. but prob. from Maintenance Div., Hq. VIII AFSC, n.d. but prob. late 1943, pp. 4-7; ltr., Maj. Gen. H. J. F. Miller to Eaker, 10 June 1943; Lockheed Overseas Corp., Plans for the Modification Program in the ETO, n.d. but prob. summer 1943, pp. 1, 3-4; ltr., Col. Beaman, Exec., 1st Bomb. Wing to CG VIII BC, 2 June 1943.

122. Ltr., H. J. F. Miller to Stratemeier, 20 Mar. 1943.

123. Ltr., Col. Castle to Lt. Col. Imlay, Hq. VIII BC, 20 Feb. 1943; memo on modification cited in n. 121, pp. 7-9; Minutes of Meeting Held at WIDEWING, Bushy Park, on Thursday, 4 Feb. 1943.

124. Memo on modification cited in n. 121, pp. 9-12; ltr., Hq. 8th AF to CG VIII AFSC, 10 May 1943; Modification Board, Minutes of Mtgs., 12, 21 June, 12 July 1943; Hq. 8th AF SO 22, 10 Aug. 1943, par. 7.

125. Ltr., Maj. Gen. H. J. F. Miller to CO AAF Station 597, 18 June 1943; ltr., Miller to Eaker, 10 June 1943.

126. Ltr., Col. J. S. Griffith, Chief, Maintenance Div., Hq. VIII AFSC, Modifications, P-47's, 7 July 1943; ltr., Col. Griffith, Modifications (B-17, B-24), 22 June 1943; memo on modification cited in n. 121, pp. 5-6.

127. History, VIII AFSC, chap. v, pp. 203-4.

#### NOTES TO CHAPTER 19

1. CCS 242/6, 25 May 1943, pp. 2, 4-5.
2. CCS 303/3, 17 Aug. 1943.
3. CCS 67th Mtg., 22 Jan. 1943; CCS 169, 23 Jan. 1943.
4. CCS 169/8/D, 23 Apr. 1943; COSSAC (43) 1st Mtg., 17 Apr. 1943.
5. History, COSSAC, pp. 1, 8.
6. Ltr., Eaker to Arnold, 5 June 1943.
7. *Ibid.*; ltr., Devers to C/S U.S. Army, 6 July 1943; ltr., Eaker to CG ETOUSA, 10 Sept. 1943; ltr., Maj. Gen. W. O. Butler, AEAf to Gen. Giles, Hq. AAF, 13 Nov. 1943. The AEAf made a number of requests for staff officers from the United States during 1943-44. (CM-IN-17262, Devers to Arnold, 27 June 1943; CM-OUT-12114, Arnold to Devers, 29 June 1943.)
8. Memo for Eaker from Candee, 21

Apr. 1943; COSSAC (43) 5th Mtg., 18 May 1943.

9. CCS 65th Mtg., 21 Jan. 1943.

10. CCS 217, 14 May 1943.

11. CCS 83d Mtg., 13 May 1943.

12. Info. supplied by British Air Ministry, Air Hist. Br. (hereinafter cited as BAM [AHBJ]).

13. Ltr., Hq. 8th AF to CG VIII BC and CG VIII ASC, 17 June 1943. The VIII ASC directed its first operation on 16 July 1943.

14. AFSHO Special File 77 (ltrs.).

15. *Ibid.*; COSSAC (43) 12th Mtg., 26 June 1943.

16. COSSAC (43) 13th Mtg., 2 July 1943; Hist. Data, American Component, AEAf, p. 10; CM-IN-1884, Devers to Arnold, 3 July 1943.

17. Ltr., McNarney to Overseas Commanders, 1 Apr. 1943.

18. Msg. R7578, Arnold to Andrews, 1 May 1943.

19. Ltr., Arnold to Bradley, 1 May 1943.

20. Minutes, 8th AF Commanders' Mtg., 6 May 1943, p. 1.

21. Ltr., Bradley to CG AAF, 28 May 1943, with 1st and 2d inds. and 16 annexes.

22. *Ibid.*, p. 1.

23. *Ibid.*, p. 4, and Tactical Air Force Annex.

24. Hq. 8th AF A-1 Periodic Rpt., May 1943; ltr., Bradley to CG AAF, 28 May 1943, p. 4, and Service Command Annex.

25. Bradley ltr. cited in n. 24.

26. Minutes, 8th AF Commanders' Mtg., 14 June 1943; msg. R631, AGWAR to ETOUSA, 7 July 1943; ltr., Col. P. W. Edwards, OPD, WD to Maj. Gen. I. H. Edwards, C/S, ETOUSA, 28 Aug. 1943; Liaison Officer of VIII AFSC at Hq. AAF, Daily Diary, 30 Aug. 1943; draft ltr., Eaker to Arnold, n.d. but Sept. 1943.

27. 3d ind. (ltr., Bradley to CG AAF, 28 May 1943), WD to CG ETOUSA, 18 Aug. 1943.

28. Msg., ETOUSA to AGWAR, 20 Aug. 1943; ltr., Eaker to CG ETOUSA, 28 Aug. 1943.

29. Msg., AGWAR to ETOUSA, 4 Sept. 1943; R&R, AC/AS, OC&R, Theater Br. (Col. O. P. Weyland) to C/AS, Hq. AAF, 14 Sept. 1943.

30. Ltr., Hq. 8th AF to all commands, 8th AF, 21 Sept. 1943; msg. R3799, Marshall to Devers, 2 Oct. 1943.

31. CCS 244/1, 25 May 1943, Annex IV, App. A.

32. Key Plan for the Reception, Accommodation and Maintenance of the U.S. Forces (4th ed.).

33. CCS 329/2, 26 Aug. 1943, Annex IV, App. A.

34. Hq. AAF, 12 August 1943 Deployement, Tab A, Hq. 8th AF.

35. Msg. R3799, AGWAR to ETOUSA, 20 Oct. 1943; msg., ETOUSA to AGWAR, 13 Oct. 1943; Hq. 8th AF, Eighth Air Force Troop Requirements, 30 Nov. 1943.

36. CCS 217/1, 19 Oct. 1943; msg. R4757, AGWAR to ETOUSA, 23 Oct. 1943; ltr., Hq. VIII AFSC to Hq. 8th SADA, 4 Dec. 1943.

37. See sources in n. 35; Office of Stat. Control, AAF Stat. Digest, Dec. 1945 (hereinafter cited as AAF Stat. Digest), p. 8; Hq. AAF, Stat. Sum. of 8th AF Opns., European Theater, 17 Aug. 1942-8 May 1945, 10 June 1945 (hereinafter cited as Stat. Sum., 8th AF), p. 12.

38. Msg. R7773/6562, Marshall to Eisenhower, 7 Jan. 1944; msg. R8127/7205, Marshall to Morgan and Spaatz, 18 Jan. 1944.

39. Ltr., Eaker to Giles, 29 Feb. 1944; CM-IN-22609, CCS to Gen. H. M. Wilson, 31 Mar. 1944.

40. AAF Stat. Digest, p. 8; Stat. Sum., 8th AF, pp. 9-11.

41. AAF Stat. Digest, pp. 157-58.

42. For a discussion of the Air Service Command training program in the United States and its relationship to the Bradley Plan, see Organization and Training of Tactical Service Units for Overseas Air Forces, Pt. II, 1942 to 1945, pp. 84-85, 92-106. See also Air Service Command: An Administrative History, 1921-44, pp. 55-56.

43. Memo for CG AAF from McNarney, 13 Aug. 1943; Org. and Tng. of Tac. Service Units, pp. 92-94.

44. Msg. R2580, Marshall to Devers, 3 Sept. 1943; msg. W4110, Arnold to Giles, 6 Sept. 1943; msg. 4128, Arnold to Marshall, 6 Sept. 1943; interview with Maj. Gen. H. J. Knerr by A. Goldberg, 24 Nov. 1947.

45. Msg. R2994, Arnold to Devers, 12 Sept. 1943; memo for Brig. Gen. H. A. Craig, AC/AS, OC&R from Maj. Gen. B. M. Giles, C/AS, 8 Sept. 1943; memo for

Brig. Gen. R. W. Harper, AC/AS, Tng. from Craig, 10 Sept. 1943. For a discussion, see Org. and Tng. of Tac. Service Units, pp. 105-6.

46. Stat. Sum., 8th AF, p. 7; AAF Stat. Digest, p. 33.

47. History, 8th AF Replacement Depot, pp. 3, 34-35; Hq. 70th Replacement Depot, Review of Operations (UK Stations Only), 3 Mar. 1945; interview with Col. J. Riley, Dir. of Personnel, Hq. USSTAF, by Capt. A. Goldberg, 29 Mar. 1945; ltr., Col. T. A. Rader, CO 12th RCD to CG VIII AFSC, 18 Oct. 1943.

48. Review of Operations. According to a memo for A-3, Hq. 8th AF from Signal Officer, Hq. VIII AFSC, 25 Nov. 1943, as of that date unassigned signal troops in the United Kingdom numbered 2,000 EM and 361 officers. The author, as a casual officer, spent several months in late 1943 and early 1944 at AAF Station 145 (Rackheath) in the 2d Bombardment Division. There were more than a hundred QM and Signal Corps officers at Rackheath, almost all of them in enforced idleness, some of whom awaited permanent assignments for almost six months. There were similar groups at other bases awaiting assignments to units.

49. By 22 January 1944, according to the Hq. VIII AFSC Weekly Activity Report, 22 January 1944, 75 per cent of all units established on the War Department troop basis for the Eighth and Ninth Air Forces had been formed. According to the Hq. ASC-USSTAF Weekly Activity Report, 27 May 1944, pp. 4-5, the Eighth Air Force had 98.9 per cent and the Ninth Air Force 102 per cent of authorized strength.

50. Dir. of Personnel, Hq. USSTAF, Number of AAF Personnel Completing Formal Courses of Instruction at Schools in United Kingdom, June 1944.

51. CM-OUT-12169, Arnold to Brereton, 31 July 1943; CM-IN-2430, Brereton to Arnold, 4 Aug. 1943.

52. Ltr., Arnold to Brereton, 11 Aug. 1943; memo for AC/AS, Plans from Brig. Gen. E. S. Perrin, DC/AS, 25 Aug. 1943; ltr., Eaker to Hansell, 25 Aug. 1943.

53. Lewis H. Brereton, *The Brereton Diaries* (New York, 1946), pp. 213-17; ltr., Devers to C/S U.S. Army, 10 Sept. 1943.

54. Hq. 9th AF GO 100, 16 Oct. 1943.

55. Hq. ETOUSA GO 62, 11 Sept. 1943.
56. Hq. USAAFUK GO 1, 15 Oct. 1943 (corrected copy).
57. Ltr., Bradley to CG AAF, 28 May 1943, pp. 1-4.
58. For a discussion of Knerr's work at the Air Service Command, see History of the Control Function, ASC, 1942-44, pp. 25-28.
59. Bradley ltr. cited in n. 57, pp. 2-3.
60. *Ibid.*, p. 3.
61. Hq. VIII AFSC Memo 160-12, 31 July 1943.
62. Hq. VIII AFSC Memos 160-12 (31 June), 160-13 (8 Aug.), 160-14 (4 Sept. 1943).
63. Hq. VIII AFSC Memos 160-12 (31 July), 160-14 (4 Sept. 1943); Hq. SADA GO 2, 9 Aug. 1943.
64. Msg. R5206, AGWAR to ETOUSA, 3 Nov. 1943; Hq. VIII AFSC GO 55, 9 Nov. 1943.
65. VIII AFSC Mtg. 38, 14 Sept. 1943; memo for Gen. Knerr from Lt. Col. J. Preston, Acting Plans and Statistics Officer, Hq. VIII AFSC, 25 Nov. 1943. No subdepos for the VIII Fighter Command were ever activated. (8th AF Commanders' Mtg., 25 Oct. 1943; VIII AFSC Mtg. 92, 2 Dec. 1943; 8th AF Station List and Strength Rpt., 6 May 1944, p. 64.)
66. Hq. VIII BC GO 149, 13 Sept. 1943.
67. Memo for A-4, Hq. 8th AF from Engineer, 8th AF, 7 Aug. 1943; ltr., Eaker to Portal, 12 Aug. 1943; draft ltr., Eaker to ACM Courtney, AMSO, Air Ministry, 29 Sept. 1943; memo for Brig. Gen. J. B. Newman, Jr., Engineer, USAAFUK from Lt. Col. S. Schroeder, 11 Dec. 1943.
68. Memo for A-4, 8th AF from Engineer, 8th AF, 7 Aug. 1943; Report of Lt. Gen. Ira C. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942, to Dec. 31, 1943 (hereinafter cited as Eaker Rpt.), App. D, p. 12. USSTAF occupied 126 airfields in the United Kingdom in June 1944. (Chief Engineer, ETO, Final Rpt., 1942-45, I, 250.)
69. Draft ltr., Eaker to ACM Sir C. L. Courtney, 29 Sept. 1943.
70. *Ibid.*; ltr., Maj. Gen. C. R. Moore, Chief Engineer, ETOUSA to E. Holloway, Air Ministry, D.G.W., 7 Mar., 22 June 1944; ltr., Col. J. R. Hardin, Deputy Chief Engineer, ETOUSA to CO Eastern Base Sec., SOS, 11 Mar. 1944; Chief Engineer, ETO, Final Rpt., 1942-45, I, 258-59.
71. Hq. VIII AFSC Weekly Activity Rpt., 18 Dec. 1943.
72. Memo for CG USAAFUK from Engineer, USAAFUK, 14 Nov. 1943; ltr., CG VIII BC to CG's Bomb. Divs., 18 Nov. 1943; Construction Program, USAAFUK, 15 Nov. 1943.
73. 8th AF, Station List and Strength Rpt., 6 Jan. 1944, pp. 25-28, 34-35.
74. Plans and Stat. Office, Hq. IX AFSC, IX AFSC Monthly Progress Rpt., Nov. 1943, p. 2; *ibid.*, Mar. 1944, p. 6.
75. *Ibid.*, Nov. 1943, p. 37; Construction Program, USAAFUK, 15 Nov. 1943; memo for Exec., D/S, Hq. ASC-USSTAF from Chief, Control Sec., 14 June 1944.
76. Hq. VIII AFSC Memo 160-13B, 10 Sept. 1943. For a discussion, see History, VIII AFSC, chap. ii, pp. 121-26.
77. 93d MRU, Hq. ASC-USSTAF, Station List and Strength Return, AAF in UK and Northwest Europe, 30 June 1944.
78. Ltr., Knerr to CG AAF, 1 Feb. 1944. The contract was subsequently canceled and the depot was militarized in July 1944.
79. VIII AFSC Mtg. 57, 21 Oct. 1943; USAAFUK Commanders' Mtg., 6 Dec. 1943.
80. Ltr., Knerr to CG ASC, 23 June 1943, p. 2; Report of Proceedings of Board of Officers, Hq. VIII AFSC, 17 Dec. 1943; ltr., CG 8th AF to CG ETOUSA, 30 Dec. 1943; ltr., Lee to Spaatz, 25 Jan. 1944; ltr., Spaatz to CG AAF, 18 Feb. 1944; Minutes, Special Staff Mtg., Hq. VIII AFSC, 10 Feb. 1944; memo for AC/AS, MM&D from Maj. Gen. L. Lutes, Dir., Plans and Opns., ASF, 18 Feb. 1944; Hq. ASC-USSTAF G-4 Periodic Rpt. for Quarter Ending 31 Mar. 1944; ltr., Lutes to Knerr, 23 Apr. 1944 and 1st ind., Knerr to Lutes, 10 May 1944; ltr., Knerr to Lee, 23 May 1944.
81. Stat. Control Office, Hq. AAF Rpt. SC-SS-1989, pp. 1-2; ltr., Giles to AM Welsh, 6 Jan. 1944; Hq. ASC-USSTAF Weekly Activity Rpt., 11 Mar. 1944.
82. Maintenance Div., Hq. VIII AFSC, Notes on Assembly, n.d. but prob. early 1944.
83. Ltr., Hq. USSTAF to CG's 8th, 9th AF's and BADA, 4 Feb. 1944; 3d Air Div., Summary and Analysis of 3d Air Div., 27 June 1945, p. 31. The notoriously bad



English weather hampered ferrying operations as well as combat operations. (See, for instance, Consolidated 27th Air Transport Group Hist. Rpt., May 1944, p. 4.) Of the daily May 1944 average of fifty-nine replacement aircraft delayed in delivery for all reasons, more than a third were delayed because of weather. The winter months were, of course, worse.

84. Combined Administrative Committee 24/1, 29 Dec. 1943; History, VIII AFSC Supply Div., 1942-43, Petroleum Sec., pp. 14-15; draft historical study, AFSHO, Logistical Plans and Problems, 1941-43, with Special Reference to Build-up of the Eighth Air Force, pp. 67-68.

85. Hq. VIII AFSC Weekly Activity Rpts., 30 Oct. 1943, pp. 4-5, 19 Feb. 1944, p. 10; Hq. ASC-USSTAF Weekly Activity Rpts., 11 Mar., 29 Apr. 1944; 8th AF Commanders' Mtg., 26 July 1943, p. 1; Summary and Analysis of 3d Air Div., p. 42.

86. 8th AF Commanders' Mtg., 14 June, p. 2, 15 Nov. 1943, p. 4; Hq. VIII AFSC Weekly Activity Rpts., 3, 31 July 1943; ltr., Eaker to Frank, 22 July 1943; memo for Frank from Knerr, 17 Aug. 1943; ltr., CG IX AFSC to CG USSTAF, 8 Apr. 1944; ltr., Col. J. S. Griffith, Chief, Maintenance Div., Hq. VIII AFSC to CO SADA, 5 Oct. 1943; 2d ind. (ltr., CG VIII BC to CG VIII AFSC, 29 Oct. 1943), CO SADA to CG VIII AFSC, 24 Nov. 1943; Hq. ASC-USSTAF G-4 Periodic Rpt. for Quarter Ending 31 Mar. 1944, p. 3; ltr., Col. W. W. Dana, Chief, Overseas Supply Sec., Supply Div., Hq. ASC to CG VIII AFSC, 18 Nov. 1943.

87. Ltr., Knerr to CG 9th AF, 11 Jan. 1944; memo for Stat. Control Office, Hq. ASC-USSTAF from ordnance officer, 7 Apr. 1944; Hq. ASC-USSTAF Weekly Activity Rpt., 8 Apr. 1944; memo for Knerr from CG IX AFSC, 17 Apr. 1944; memo for Brig. Gen. C. P. Kane, Hq. ASC-USSTAF from H. J. F. Miller, 29 May 1944.

88. History, VIII AFSC Supply Div., 1942-43, Misc. Problems, pp. 5-6.

89. Ltr., CG VIII AFSC to CG 8th AF, 9 Mar. 1943; memo for U.K. Procurement Sec., Hq. VIII AFSC from Supply Div., 1 Dec. 1943; memo for CG VIII AFSC from Col. W. W. Messmore, Acting Chief, Supply Div., 6 Dec. 1943; memo for Chief, Control Sec., Supply Div., Hq.

ASC-USSTAF from Capt. A. A. Townsend, 5 Apr. 1944.

90. Ltr., Brig. Gen. L. W. Miller, C/S, VIII AFSC to MAP, 10 Feb. 1943; ltr., Knerr to CG AAF, attn. Brig. Gen. B. E. Meyers, 10 Dec. 1943; memo for Chief, Control Sec., Supply Div., Hq. ASC-USSTAF from Capt. A. A. Townsend, 7 Apr. 1944; ltrs., Col. J. H. Houghton, Dir. of Supply, ASC-USSTAF to CG AAF, attn. AC/AS, MM&D, 10 July, 16 Sept. 1944.

91. R&R, comment 5, Brig. Gen. M. A. Fairchild, AFDMR to AFRAD, 24 May 1942; ltr., Brig. Gen. B. E. Meyers, C/S, Materiel Comd. to CG ETOUSA, 11 Nov. 1942.

92. Msg. 3062, ETOUSA to AGWAR, 3 Oct. 1942; memo for Chief, Supply Div., Hq. VIII AFSC from Lt. Col. R. W. Chaffee, 18 Feb. 1943; memo for Supply Div. from C/S VIII AFSC, 29 Jan. 1943; memo for Chief, Supply Div., Hq. VIII AFSC from Lt. A. A. Townsend, 8 Apr. 1943; ltr., Col. Wood, Chief, Supply Div. to Air Corps Procurement Officer, VIII AFSC, 31 May 1943; ltr., Knerr to CG 8th AF, 12 Oct. 1943; memo for Chief, Supply Div., Hq. VIII AFSC from Lt. Col. K. Collins, 3 Aug. 1943; memo for Asst. Chief, Supply Div., Hq. VIII AFSC from Collins, 14 Aug. 1943; ltr., Brig. Gen. F. O'D. Hunter, CG VIII FC to CG 8th AF, 22 Mar. 1943.

93. Memo for CG 8th AF from Knerr, 10 Aug. 1943; memo for Asst. Chief, Supply Div., Hq. VIII AFSC from Col. Collins, 14 Aug. 1943; ltr., Knerr to CG 8th AF, 12 Oct. 1943; msg. 45088, Hq. VIII FC to Hq. 8th AF, 28 July 1943.

94. Memo for Chief, Supply Div., Hq. VIII AFSC from Col. Collins, 19 Aug. 1943; memo for D/C VIII AFSC from Col. A. W. Martenstein, Chief, Supply Div., 31 Aug. 1943; R&R, Req. Div., AC/AS, OC&R to AC/AS, OC&R, 15 Sept. 1943; ltr., Knerr to CG 8th AF, 12 Oct. 1943.

95. Ltr., Eaker to Portal, 14 Oct. 1943; ltr., Arnold to Portal, 31 Oct. 1943; R&R cited in n. 94; ltr., Eaker to ACM Sir Wilfred Freeman, MAP, 14 Oct. 1943; ltr., Eaker to Arnold, 22 Oct. 1943.

96. Memo for Chief, Supply Div., Hq. VIII AFSC from Col. Collins, 3 Dec. 1943; memo for Gen. Eaker from Col. J. H. Wallace, A-3, 8th AF, 10 Dec. 1943; His-

tory, VIII AFSC Supply Div., 1942-43, Misc. Problems, p. 5.

97. Msg. H5103, Knerr to Frank, 17 Jan. 1944; memo for Arnold from Gen. Perrin, DC/AS, 30 Mar. 1944; memo for CG ASC-USSTAF from Col. J. H. Houghton, Dir. of Supply, 22 Apr. 1944.

98. Minutes, Staff Mtg., Hq. VIII AFSC, 16 Apr. 1943; 3d ind. (ltr., 1958th QM Truck Co. to CO 1515th QM Truck Bn., 23 June 1943), CG VIII AFSC to CO 1515th QM Truck Bn., 12 July 1943; Minutes, 8th AF Commanders' Mtg., 10 July 1943; ltr., Hq. 8th AF to CG ETOUSA, 11 Aug. 1943; interview with Col. G. D. Grubb, CO CSW by Lt. A. Goldberg, 5 July 1944; History, AAF Station 473, 1943, pp. 8, 25. General Lee apparently agreed with Eaker's view. (See notes on Staff Conf., Hq. SOS, ETOUSA, 30 Aug. 1943, p. 19.)

99. Ltr., Hq. 8th AF to CG ETOUSA, 11 Aug. 1943; ltr., CG VIII AFSC to CG 8th AF, 26 June 1943; Hq. VIII AFSC GO 32, 27 Aug. 1943; Minutes, Staff Mtg., Hq. VIII AFSC, 9 Nov. 1943; 1st ind. (ltr., Col. Grubb to CG VIII AFSC, 27 Nov. 1943), CG VIII AFSC to CG 8th AF, 6 Dec. 1943; History, Combat Support Wing, 1943, Feb., Mar. 1944; Grubb interview.

100. 1st ind. (ltr., Col. Grubb to CG VIII AFSC, 27 Nov. 1943), CG VIII AFSC to CG 8th AF, 6 Dec. 1943; History, Accomplishments of the Combat Support Wing during the Air War in Europe, 27 Aug. 1943-8 May 1945, June 1945, pp. 3-8.

101. Msg. R8927, AGWAR to ETOUSA, 28 May 1943; ltr., Col. L. P. Arnold, CO 27th ATG to Gen. Knerr, 17 Dec. 1943; memo for Knerr from Col. Arnold, 10 Jan. 1944; msg. A-3854, Gen. Arnold to Eaker, 8 Oct. 1943; History, USSTAF, III, chap. iii, 72-73; Hq. BADA Semi-Annual Stat. Sum., 1 Jan.-30 June 1944, p. 3; Hq. 9th AF GO 109, 28 Oct. 1943.

102. Ltr., Eaker to CG ETOUSA, 4 June 1943; ltr., Maj. Gen. Virgil L. Peterson, IG to DC/S WD, 5 Aug. 1943.

103. Ltr., Arnold to Eaker, 15 June 1943.

104. Ltr., Col. J. S. Griffith, Chief, Maintenance Div., Hq. VIII AFSC to CO's BADA, SADA, TADA, 10 Aug. 1943.

105. Ltr., Eaker to Arnold, 11 Sept. 1943.

106. Hq. SADA Memo 70-10, 17 Oct. 1943; Hq. 8th AF Memo 65-6, 12 Nov.

1943; ltr., Col. Griffith to CO's 8th BADA and 8th SADA, 7 Dec. 1943.

107. Hq. 8th AF, Station List and Strength Rpt., 6 Apr. 1944.

108. Ltr., Hq. 8th AF to commands, 21 Sept. 1943; Hq. 8th AF Memo 155-1, 12 Oct. 1943; ltr., CG VIII FC to CG 8th AF, 28 Nov. 1943.

109. VIII AFSC Mtg. 101, 15 Dec. 1943; memo for Spaatz from Knerr, 22 Jan. 1944; Knerr interview.

110. Hq. VIII AFSC GO's 42 (21 Oct.), 48 (26 Oct.), 52 (1 Nov. 1943); History, Burtonwood Repair Depot, 1943, chap. iv, pp. 1-4; History, Base Air Depot No. 2, 1943, pp. 3-4; 93d MRU, Hq. ASC-USSTAF, Station List and Strength Return, AAF in United Kingdom, 31 May 1944.

111. History, Base Air Depot No. 2, 1943, Feb., Mar., Apr., 1944; History, Base Air Depot No. 1, Jan., Feb., Mar., Apr. 1944; Plans and Stat. Office, Hq. IX AFSC, IX AFSC Monthly Progress Rpt., Dec. 1943, p. 4, Feb. 1944, p. 39; memo for Spaatz from Knerr, 22 Jan. 1944.

112. 2d ind. (ltr., CG VIII BC to CG VIII AFSC, 29 Oct. 1943), CO SADA to CG VIII AFSC, 24 Nov. 1943; ltr., CG IX AFSC to CG USSTAF, 8 Apr. 1944.

113. Burtonwood and Warton were in full operation in April 1944. See depot histories for the month. See, also, Hq. VIII AFSC Weekly Activity Rpt., 11 Dec. 1943; memo for Spaatz from Knerr, 22 Jan. 1944; 31st SCU, Hq. BADA Quarterly Review of BADA Activities, Jan.-Mar. 1944; BADA Stat. Sum., Apr., p. 2a, May 1944, p. 2.

114. Stat. Control Office, Hq. AAF, Rpt. SC-SS-1989, 14 Aug. 1947, pp. 7-8, 10; ltr., H. J. F. Miller to Arnold, 9 Oct. 1943.

115. Memo for A-3, Hq. 8th AF from Knerr, 2 Dec. 1943; 1st ind. (memo for Knerr from Eaker, 29 Nov. 1943), Knerr to CG 8th AF, 3 Dec. 1943; USAAFUK Commanders' Mtg., 6 Dec. 1943, p. 2; ltr., Col. Griffith, Chief, Maintenance Div., Hq. VIII AFSC to CO 8th AF BADA, 18 Dec. 1943; Maintenance Div., Hq. VIII AFSC, Notes on Assembly, n.s., n.d. but prob. Jan. or Feb. 1944.

116. Ltr., Knerr to Sec., MAP, 21 Mar. 1944; Stat. Control Office, Hq. ASC-USSTAF, Aircraft Arrived and Estimated Future Arrivals of Aircraft Requir-

ing Assembly 1944, 22 June 1944; Hq. BADA, Semi-Annual Stat. Sum., 1 Jan.-30 June 1944, p. 13.

117. Ltr., Eaker to CG ETOUSA, 4 June 1943; memo for Maj. M. L. Butzel, Maintenance Div., Hq. VIII AFSC from Lt. T. C. Keys, 30 Dec. 1943; memo for A-3, Hq. 8th AF from A-4, 28 Dec. 1943.

118. Ltr., Maj. Gen. H. J. F. Miller to CO AAF Station 597, 18 June 1943; Hq. VIII AFSC Weekly Activity Rpt., 31 July 1943, p. 2; chart, Stat. Control Office, Hq. ASC-USSTAF, Life Cycle of a Heavy Bomber in the ETO, 1944.

119. VIII AFSC Monthly Progress Rpt., Sept. 1943, p. 21; Hq. BADA, Semi-Annual Stat. Sum., 1 Jan.-30 June 1944, p. 5.

120. Ltr., Hq. VIII BC to CG 8th AF, 22 Dec. 1943; ltr., Knerr to CG 8th AF, 25 Dec. 1943.

121. Memo for C/AS, Hq. AAF from Brig. Gen. E. S. Perrin, DC/AS, 16 Sept. 1943; memo for McNarney from Giles, 3 Apr. 1944; History, Maintenance Div., Hq. ASC-USSTAF, 1944, pp. 2-4.

122. VIII AFSC Monthly Progress Rpt., Aug. 1943, pp. 21-23, 30, Sept. 1943, pp. 28, 29, Jan. 1944, p. 3; Hq. BADA, Semi-Annual Stat. Sum., 1 Jan.-30 June 1944, pp. 16-17, 21-22.

123. AAF Stat. Digest, pp. 157-58.

124. Eaker Rpt., p. 10. In a memo for the CG AAF on 19 June 1943, the Assistant Secretary of War for Air, Robert A. Lovett, discussed the gravity of the repair problem in the ETO.

125. ORS, Hq. 8th AF, Reduction of Losses and Battle Damage, 12 Feb. 1944, pp. 6-7.

126. Dir. of Maintenance, Hq. ASC-USSTAF, Repair of Battle Damaged Bombers, June 1944, Pt. III. This report and the preceding one are thorough studies of the battle damage problem from the maintenance and combat viewpoints, respectively. (Memo for C/S Hq. 8th AF from Knerr, 30 Sept. 1943.)

127. Repair of Battle Damaged Bombers.

128. *Ibid.*; History, Maintenance Div., Hq. ASC-USSTAF, Pt. IV.

2. *Ibid.*

3. *Ibid.*

4. T/M Rpt. 63 and papers attached in USSTAF mission folder for this mission.

5. *Ibid.*

6. VIII BC Narrative of Opns. 65; 8th AF Semi-monthly Rpt. 5; USSBS, Oil, Chemicals and Rubber Div., Plant Rpt. 4, Synthetic Rubber Plant, Huels, Germany, Feb. 1946.

7. USSBS, Huels Rpt., p. 1.

8. *Ibid.*, p. 34.

9. *Ibid.*, pp. 1-3.

10. USSBS, *Over-all Report (European War)* (Washington, 1945), p. 46.

11. Quoted in 8th AF Semi-monthly Rpt. 10, p. 31. Cf. *ibid.*, Nos. 9, 12; msg., 8th AF to ETOUSA, 24 June 1943, in USSTAF Mission Folder 65. See also Rpt. to COA by Subcommittee on Western Axis Rubber Industry, 17 Feb. 1943.

12. T/M Rpt. 65. Cf. USSBS, Huels Rpt., p. 33.

13. T/M Rpt. 65; VIII BC Narrative 65.

14. USSBS Huels Rpt., pp. 8, 33, 43.

15. T/M Rpts. 66-73; 8th AF Semi-monthly Rpt. 6. Cf. 8th AF Semi-monthly Rpts. 10, 11, 12, 18, 28, 32.

16. T/M Rpts. 66-73.

17. *Ibid.*, 75; 8th AF Semi-monthly Rpt. 7; VIII BC Narrative 75.

18. T/M Rpt. 75.

19. USSBS, *The Light Metal Industry of Germany*, 2 Nov. 1945, Pt. I, Annex A, p. iii.

20. *Ibid.*, pp. 22, 26, 27, 35, and Annex A, *passim*.

21. OWI Rpt. from Stockholm, 10 Aug. 1943, in USSTAF Mission Folder 75.

22. T/M Rpt. 75; ltr., Brig. Gen. F. L. Anderson to Stratemeyer, 21 July 1943; CM-IN-16446, 27 Nov. 1943, London series, Nov. 1943. Cf. T/M Rpts. 76 and 77.

23. T/M Rpt. 76.

24. USSBS, Rubber Plant Rpt. 2, Continental Gummi-Werke A.G., Hannover, Germany, 8 Sept. 1945. Cf. intel. rpts. quoted in 8th AF Semi-monthly Rpts. 9, p. 14, and 10, p. 34; T/M Rpt. 77.

25. T/M Rpt. 78, 8th AF Semi-monthly Rpts. 7, 10, p. 34.

26. Ltr., Col. L. Ordway to Eaker, 15 Aug. 1943.

27. T/M Rpt. 78.

28. CM-IN-21332, Eaker to Arnold, 30

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1. Tactical Mission (hereinafter cited as T/M) Rpt. 62.

July 1943; History, VIII FC, Aug. 1942-Apr. 1945.

29. History, VIII AFSC, chap. v, pp. 44 ff.

30. R&R, comment 5, AFDMR to AFRAD, 24 May 1942.

31. CM-IN-338, Eaker to Arnold, 1 July 1943; ltr., Eaker to Giles, 29 June 1943; ltr., Eaker to Giles, 9 July 1943; rpt. by Maj. D. J. Munro, AAF Proving Ground Comd. to AC/AS, OC&R, Aug. 1943.

32. CM-IN-338, Eaker to Arnold, 1 July 1943; CM-OUT-4212, Arnold to Eaker, 10 July 1942; ltr., Giles to Eaker, 19 July 1943; CM-OUT-3797, Arnold to Eaker, 8 Sept. 1943; CM-IN-9113, Eaker to Arnold, 12 Sept. 1943.

33. Ltr., Eaker to C/S ETOUSA, 2 July 1943; CM-IN-2432, Eaker to Arnold, 4 July 1943; ltr., Eaker to Giles, 18 July 1943; ltr., Giles to Eaker, 30 July 1943.

34. VIII FC Rpts., 8 Aug. 1943; ORS, VIII FC Rpt., 13 Aug. 1943.

35. CM-IN-21332, Eaker to Arnold, 30 July 1943; ltr., Lt. Col. Cass S. Hough to CG VIII FC, 17 Aug. 1943, in Achtung Indianer, App. O; VIII FC, The Long Reach, 29 Nov. 1944. Cf. 8th AF and AAF Evaluation Board (ETO), Eighth Air Force Tactical Developments, Aug. 1942-May 1945, 9 July 1945, p. 97, which does not always agree with the above-listed sources.

36. T/M Rpt. 80; History, VIII FC, Aug. 1942-Apr. 1945.

37. USSBS, Air Frames Plant Rpt. 8, Gerhard Fieseler Werke G.m.b.H., Kassel, Germany, 15 Oct. 1945.

38. Ltr., Eaker to Lovett, 6 Aug. 1943.

39. Interview with A/Cdre. A. C. H. Sharpe and W/C Robinson, 10 Aug. 1943.

40. Rpt. from Captured Personnel and Materiel Br., MID, WD, 3 June 1945.

41. Figures compiled from VIII BC Narratives.

42. T/M Rpts. 81, 82, and 83.

43. USSBS, The German Anti-Friction Bearings Industry, 7 Nov. 1945, pp. 17-18.

44. T/M Rpt. 84.

45. AAF Reference History No. 3, The Ploesti Mission of 1 Aug. 1943, chap. ii.

46. CM-IN-6025, Tedder and Brereton to Marshall and Eisenhower, 9 July 1943.

47. Ltr., Eaker to Spaatz and Brereton, 14 July 1943.

48. *Ibid.* See also AAF Reference History No. 10, The War against the Luftwaffe (hereinafter cited as AAFRH-10), pp. 30 ff.

49. Sources in n. 48; CM-IN-14163, Eisenhower to Marshall, 20 July 1943; CM-IN-12257, Devers to Marshall and Arnold, 17 July 1943; CM-OUT-9495, CCS to Eisenhower, 23 July 1943.

50. USSBS Air Frames Plant Rpt. 9, Wiener Neustaedter Flugzeugwerke A. G. (and Subsidiaries), 28 Sept. 1945.

51. T/M Rpt. 84; ltr., F. L. Anderson to Eaker, n.d.; Brig. Gen. F. L. Anderson, Diary, 16, 17 Aug. 1943.

52. T/M Rpt. 84.

53. *Ibid.*

54. 8th AF Semi-monthly Rpt. 9; rpts. in USSTAF Mission Folder 84.

55. USSBS, The German Anti-Friction Bearings Industry, pp. 28, 48, 52; rpt., Hq. MAAF, Air Attacks on Axis Ball Bearing Industry, in History, MAAF, 10 Dec. 1942-1 Sept. 1944, Vol. V; USSBS, Aircraft Div. Industry Rpt., Strategic Bombing of the German Aircraft Industry, 2 Nov. 1945, p. 23.

56. Ltr., Col. Curtis E. LeMay to CG VIII BC, 29 Aug. 1943.

57. USSTAF Mission Folder 87.

58. Hq. AAF, Statistical Summary, Eighth AF Operations, European Theater, 17 Aug. 1942 to 8 May 1945 (hereinafter cited as Stat. Sum., 8th AF); T/M Rpt. 91; AAFRH-10, pp. 54 ff.

59. T/M Rpt. 92.

60. History, COSSAC; Minutes, conf. held at Hq. RAF Fighter Comd., 7 July 1943.

61. History, COSSAC.

62. Ltr., Eaker to Portal, 7 June 1943; ltr., Arnold to Eaker, 15 June 1943; ltr., Devers to Lt. Col. L. J. Carver, Office of War Cabinet, 22 June 1943.

63. T/M Rpts. 87-94, *passim*; ltr., Eaker to Lovett, 16 Sept. 1943.

64. Ltr., Eaker to Lovett, 16 Sept. 1943; CM-IN-7878, Devers to Marshall and Arnold, 10 Sept. 1943; ltr., Eaker to Arnold, 11 Sept. 1943.

65. T/M Rpts. for Sept. 1943, *passim*; ltr., Eaker to Arnold, 24 Sept. 1943; rpt., Hq. VIII BC, September 1943 Effort of VIII BC, 2 Oct. 1943. Cf. ORS Rpt., 17 Aug. 1943, on blind bombing.

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the Eighth Air Force, prepared under the supervision of the Radiation Lab. Hist. Office, chaps. i, ii.

67. History, 2d Bomb. Div. (and 2d Bomb. Wing), Activation to 31 Dec. 1943.

68. Radar Bombing in the 8th AF, p. 20.

69. *Ibid.*, chap. ii, *passim*.

70. *Ibid.*, pp. 22-23.

71. *Ibid.*, pp. 24-28, 78. Cf. Report of Lt. Gen. Ira C. Eaker on USAAF Activities in the U.K. Covering Period from Feb. 20, 1942, to Dec. 31, 1943, p. 9; CM-IN-6387, Eaker to Arnold, 10 Dec. 1943.

72. Radar Bombing in the 8th AF, p. 36.

73. Ltr., Eaker to Kuter, 16 Sept. 1943; ltr., Eaker to Brig. Gen. H. A. Craig, 24 Sept. 1943; ltr., Eaker to Giles, 7 Dec. 1943.

74. Radar Bombing in the 8th AF, p. 36.

75. CM-IN-306, Eaker to Arnold, 1 Oct. 1943.

76. Radar Bombing in the 8th AF, p. 37; T/M Rpt. 104; 8th AF Semi-monthly Rpt. 11, p. 5.

77. ORS memo on blind-bombing aspects of missions of 27 Sept. and 2 Oct. 1943, 27 Oct. 1943, in USSTAF Mission Folder 104; T/M Rpt. 104; VIII BC Narrative, 9 Sept. 1943; 8th AF Semi-monthly Rpt. 11, pp. 5-6.

78. ORS Rpt. on Emden Missions; T/M Rpt. 106.

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80. Ltr., Eaker to Lovett, 2 Oct. 1943; ltr., Eaker to Lord Frederic Cherwell, Office of War Cabinet, 6 Oct. 1943.

81. AFAEP study on Window, n.d. but about 4 Jan. 1944; USSTAF Folder on Window and Carpet; ltr., Eaker to Arnold, 30 July 1943; rpt., Brig. Gen. Hume Peabody, AAF Board to CG AAF, 15 Sept. 1943; History, VIII AFSC, chap. v, p. 74.

82. T/M Rpt. 111; VIII BC Narrative, 8 Oct. 1943.

83. CM-IN-6963, Eaker to Arnold, 11 Nov. 1943.

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85. USAFE Post Hostilities Investigation, German Air Defenses, Vol. I, Sec. XI.

86. T/M Rpt. 113; VIII BC Narrative, 9 Oct. 1943; USSTAF Mission Folder 113.

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88. Ltr., Eaker to Cherwell, 13 Oct. 1943.

89. ORS Rpt., n.d.

90. Ltr., Arnold to Eaker, 18 Sept. 1943.

91. 8th AF Semi-monthly Rpt., 16-30 Sept. 1943.

92. T/M Rpt. 114; VIII BC Narrative, 10 Oct. 1943.

93. CM-IN-3264, Arnold to Giles, 4 Sept. 1943.

94. VIII BC Narrative, 10 Oct. 1943.

95. T/M Rpt. 115; History, VIII FC.

96. History, VIII FC. Cf. ltr., Eaker to Devers, 26 Oct. 1943.

97. Ltr., Eaker to Arnold, 19 Oct. 1943; ltr., Chief Press Censor, U.S. Army to AC/S, A-2, 8th AF, 19 Oct. 1943, in USSTAF Mission Folder 115.

98. Ltr., Eaker to Arnold, 15 Oct. 1943.

99. T/M Rpt. 115; VIII BC Narrative, 14 Oct. 1943; CM-IN-8967, Eaker to Arnold, 15 Oct. 1943.

100. T/M Rpt. 115; USSBS, The German Anti-Friction Bearings Industry, pp. 28 ff.; CM-IN-9784, Eaker to Arnold, 16 Oct. 1943.

101. USSBS, German Anti-Friction Bearings Industry, pp. 117-18; CM-IN-9492, Eaker to Arnold, 16 Oct. 1943; msg., Marshall to Devers for Eaker, 15 Oct. 1943; press notices attached to ltr., Chief Press Censor, cited in n. 97.

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104. Press notices cited in n. 101.

105. Raid Assessment Rpt., Ball Bearing Plants, Schweinfurt, Raid of 14th October 1943, 18 Nov. 1943, in USSTAF Mission Folder 115.

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108. Rpt., Maj. D. J. Munro to AC/AS, OC&R, Aug. 1943; memo for CG AAF from Col. A. W. Brock, Jr., Dep. AC/AS, A-2, 23 Aug. 1943; CM-IN-3264, Arnold to Giles, 4 Sept. 1943.

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6. USSBS, Aircraft Div. Ind. Rpt. cited in n. 3, *passim*.

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11. JCS Memo for Information 113, 15 Aug. 1943. Cf. Appreciation of CBO to 1 Aug. 1943, n.d., n.s., filed with above; CCS 300/1, 7 Aug. 1943 (memo by JCS to CCS).

12. CCS 309, 15 Aug. 1943. Cf. sources cited in n. 11.

13. JCS 100th Mtg., 8 July 1943 (ref. JCS 442).

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22. CCS 252/2, 12 Aug. 1943; JCS 105th Mtg., 16 Aug. 1943 (ref. CCS 309).

23. CM-IN-11726, Eisenhower to CCS, 15 Sept. 1943; Stat. Sum., 8th AF; CM-IN-18007, Eisenhower to CCS, 25 Sept. 1943.

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26. Ltr., Arnold to Spaatz, 10 Aug. 1943; ltrs., Arnold to Portal, 14, 31 Oct. 1943.

27. Ltr., Arnold to Eaker, 15 June 1943; ltr., Arnold to Devers, 16 June 1943.

28. Ltr., Arnold to Devers, 16 June 1943; Stat. Sum., 8th AF; ltr., Lt. Col. F. W. Castle, AC/S, A-4, VIII BC to CG VIII BC, 17 June 1943; ltr., IG, 8th AF to CG 8th AF, 17 June 1943.

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33. Memos for Col. Loutzenheiser from Col. Berliner, 7, 11 Oct. 1943. Cf. CM-OUT-13686, Arnold to Eaker, 29 Sept. 1943.

34. CCS 319/5, 24 Aug. 1943; Appreciation of CBO to 1 Aug. 1943 cited in n. 11; JPS 302, 18 Oct. 1943, App. A, 11 Oct.



1943; memo for Arnold from Kuter, AC/AS, Plans, 26 Oct. 1943; CCS 217/2, 5 Nov. 1943; CCS 166/4, 4 Jan. 1944; History, COA, pp. 48 ff. and Tab 28.

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40. Ltr., Arnold to Portal, 14 Oct. 1943; JCS 563.

41. Memo for Arnold from AC/AS, Plans, 26 Oct. 1943; Ltr., Arnold to Portal, 14 Oct. 1943.

42. Memo for Arnold from AC/AS, Plans, 26 Oct. 1943, Tab A.

43. CCS 217/2, 5 Nov. 1943.

44. CM-IN-14271, n.s. to WAR, 19 Sept. 1943.

45. CCS 125th Mtg., 29 Oct. 1943 (ref. CCS 217/1). Cf. JCS 123d Mtg., 15 Nov. 1943.

46. CCS 217/1, 19 Oct. 1943.

47. The above-mentioned arguments may be found in one form or another in the following documents: CCS 217/1, 19 Oct. 1943; CCS 125th Mtg., 29 Oct. 1943; CCS 400, 18 Nov. 1943; CM-OUT-815, Arnold to Spaatz, 3 Aug. 1943; AFAEP Plan for Strategic Bombing Offensive against the Entire Mittel-Europa Citadel, 10 Aug. 1943; CM-IN-14271, Eisenhower to Marshall, 19 Sept. 1943. Cf. interview with Robert Lovett by Dr. B. C. Hopper, 7 June 1945.

48. Ltr., Spaatz to Arnold, 24 June 1943.

49. JCS 524/1, presented to CCS as CCS 217/1, 19 Oct. 1943; CM-IN-14271, Eisenhower to Marshall, 19 Sept. 1943.

50. CCS 124th Mtg., 22 Oct. 1943.

51. CCS 106th Mtg., 14 Aug. 1943.

52. AFSHO Special File 77 (msgs.).

53. Ltr., Eaker to Hansell, 25 Aug. 1943; CM-IN-299, Eaker to Lovett, 1 Oct. 1943; Ltr., C/S ETOUSA, 1 Oct. 1943; Ltr., Eaker to Arnold, 1 Oct. 1943.

54. File 77 (msgs.).

55. CCS 309, 15 Aug. 1943; JCS 563, 4 Nov. 1943; CCS 403/1, 3 Dec. 1943.

56. Ltr., C/S ETOUSA, 1 Oct. 1943, contains arguments as outlined by Eaker. Cf. Ltr., Eaker to Arnold, 1 Oct. 1943.

57. In addition to sources listed earlier in this chapter, see also memo for Kuter, 24 Nov. 1943, filed with CCS 403/1; notes on CCS 166/7 by CCS and JCS Sec., AC/AS, Plans, 21 Jan. 1944.

58. Notes on CCS 166/7 by CCS and JCS Sec., AC/AS, Plans, 21 Jan. 1944.

59. CCS 426/1, 6 Dec. 1943.

60. Stat. Sum., 8th AF; Tactical Mission Rpts. 116-71; History, 15th AF, Vol. I, chap. i.

61. Memo for Eaker from F. L. Anderson, n.d. but Dec. 1943.

62. History, 15th AF, Vol. I, Pt. IV.

63. On these points see the conclusions reached in Contribution of Air Power cited in n. 1, Vol. I, and in USSBS, *Overall Rpt.*

## NOTES TO CHAPTER 22

1. This is particularly evident in the minutes of the CCS and JCS during 1943.

2. CCS 113th Mtg., 20 Aug. 1943; Henry L. Stimson and McGeorge Bundy, "Time of Peril," in *Ladies Home Journal*, Jan. 1948, pp. 96-97. Roosevelt told Stimson at Quebec that Churchill had come to him and "offered to accept Marshall for the OVERLORD operation." Churchill said that he had previously promised the position to the chief of the Imperial General Staff, Sir Alan Brooke.

3. CCS 113th Mtg., 20 Aug. 1943.

4. 8th AF Commanders' Mtg., 10 Sept. 1943, p. 2.

5. AFSHO Special File 77 (ltrs.).

6. Memo for CG 8th AF from Brig. Gen. Robert C. Candee, 3 Sept. 1943; Ltr., Gen. Eaker to CG ETOUSA, 10 Sept. 1943; JCS 118th Mtg., 12 Oct. 1943, Supplementary Minutes.

7. Memo for Portal from Arnold, 20 Aug. 1943, and incl.; Ltr., Candee to CG 8th AF, n.d. but prob. late Aug. or early Sept. 1943; Ltr., Arnold to Portal, 6 Sept. 1943; Ltr., Eaker to Portal, 8 Sept. 1943; Ltr., Gen. Devers to C/S U.S. Army, 11 Sept. 1943; Ltr., Eaker to Leigh-Mallory, 13 Sept. 1943; Extract from Minutes, CPS 89th Mtg., 4 Nov. 1943.

8. Ltr., Arnold to Portal, 6 Sept. 1943; Ltr., Eaker to Portal, 8 Sept. 1943; Ltr.,

Eaker to CG ETOUSA, 10 Sept. 1943; ltr., Devers to C/S U.S. Army, 11 Sept. 1943.

9. CCS 75/3, 24 Oct. 1942. This subject was discussed at meetings of the Joint and Combined Chiefs of Staff.

10. Ltrs., Devers to C/S U.S. Army, 6 July, 11 Sept. 1943; ltr., Candee to CG 8th AF, 3 Sept. 1943; ltr., Eaker to Portal, 8 Sept. 1943; ltr., Eaker to CG ETOUSA, 10 Sept. 1943. See also address given at Hq. AAF by Col. Philip Cole, Hq. 9th AF, "Air Support of OVERLORD," 8 Aug. 1944.

11. Memo for Gen. Marshall from Maj. Gen. T. T. Handy, AC/S OPD and 5 incls., 4 Oct. 1943; memo for Marshall from Handy, 10 Nov. 1943; memo for Sec. JCS from Col. W. T. Sexton, Sec. WDGS, and incl., 5 Nov. 1943; Extract from Minutes, CCS 124th Mtg., 22 Oct. 1943; JCS 121st Mtg., 2 Nov. 1943, Supplementary Minutes, p. 4; msg. COS (4) 941, COS to Joint Staff Mission, 10 Nov. 1943; JCS 123d Mtg., 15 Nov. 1943, pp. 3-6; CCS 400/1, 26 Nov. 1943; CCS 133d Mtg., 4 Dec. 1943; Minutes of Meeting between the President and the Chiefs of Staff Held on Board Ship in the Admiral's Cabin on Friday 19 Nov. 1943 at 1500.

12. Extract from Minutes, CCS 124th Mtg., 22 Oct. 1943; Directive to Air C-in-C AEAf, Report to the Joint Staff Planners, 18 Oct. 1943.

13. For example, see Minutes of COSSAC Staff Conf., 28 Aug. 1943; CPS 86th Mtg., 25 Oct. 1943; File 706, 3 Jan. 1944.

14. Extract from Minutes, CPS 89th Mtg., 4 Nov. 1943.

15. *Ibid.*

16. CCS 304/3, 19 Oct. 1943; CCS 124th Mtg., 22 Oct. 1943; CM-OUT-7211, Marshall to Devers and Eaker, 18 Nov. 1943.

17. Ltr., Lt. Gen. F. E. Morgan, C/S SC (Designate) to AM Sir Trafford Leigh-Mallory, Directive to Air Commander in Chief, AEAf, 16 Nov. 1943.

18. Memo, Hq. AEAf, 17 Nov. 1943.

19. AFSHO Special File 77 (ltrs.).

20. Ltr., CG ETOUSA to CG American Component, AEAf, 30 Dec. 1943; memo for AC/S G-1, Hq. ETOUSA from Gen. Butler, 26 Nov. 1943; msg. W-9170, ETOUSA to AGWAR, 3 Jan. 1944.

21. 1st ind. (ltr., Gen. Barker, Hq.

COSSAC to CG ETO, 28 Nov. 1943), Gen. Devers to AG, U.S. Army, 30 Nov. 1943; ltr., Spaatz to Arnold, 1 Feb. 1944; memo, AC/AS, Plans, 22 Feb. 1944; File 706, 19 Feb. 1944. See Lewis H. Brereton, *The Brereton Diaries* (New York, 1946), p. 227.

22. Hist. Data, American Component, AEAf, p. 20. As of 3 June 1944, the RAF strength was 1,001 assigned and attached as compared with 502 Americans. (See Hq. AEAf, AEAf Personnel Data, 3 June 1944.)

23. Ltr., AOC-in-C AEAf to Hq. COSSAC, 20 Dec. 1943.

24. Ltr., F. L. Anderson to Eaker, 20 Sept. 1943; ltrs., Eaker to Spaatz, 11 Sept., 1 Oct. 1943; memo for Arnold from Marshall, 5 Nov. 1943; memo from Eaker, 26 Nov. 1943; JCS 125th Mtg., 18 Nov. 1943.

25. Msg. FAN 254, CCS to CG ETO, 23 Oct. 1943, implementing CCS 217/1.

26. JCS 125th Mtg., 18 Nov. 1943 (ref. JCS 602/1); File 77 (ltrs.).

27. JCS 601, 13 Nov. 1943; CCS 400, 18 Nov. 1943. Cf. CCS 217/1, 19 Oct. 1943; FAN 254 cited in n. 25.

28. CCS 400/1, 26 Nov. 1943.

29. Ltr., Arnold to Spaatz, n.d.

30. Ltr., Knerr to CG ASC, 23 June 1943.

31. Ltr., Knerr to CG VIII AFSC, 26 July 1943; memo for CG 8th AF from Miller, 30 July 1943; ltr., Eaker to Miller, 10 Aug. 1943; ltr., Miller to CG 8th AF, 14 Sept. 1943, and 3 incls.

32. Interview with Gen. Knerr by Capt. A. Goldberg, asst. historian, USSTAF, 12 June 1945, p. 1.

33. 8th AF Commanders' Mtg., 10 Sept. 1943; ltr., Eaker to Frank, 13 Sept. 1943; Hq. 8th AF GO 182, 11 Oct. 1943.

34. Hq. 8th AF GO 182; Hq. VIII AFSC GO 45, 24 Oct. 1943; Hq. VIII AFSC Office Memo 39, 29 Nov. 1943; memo for AG, Plans, Chief of Administration from Knerr, Hq. VIII AFSC, 3 Dec. 1943.

35. Hq. VIII AFSC Memo 160-13A, 4 Sept. 1943; memo for C/S VIII AFSC from Knerr, 3 Sept. 1943.

36. Knerr interview.

37. Ltr., Col. C. P. Cabell to Gen. Eaker, 22 Nov. 1943. See also memo for Col. D. H. Baker, Chief, Plans and Stat. Office, Hq.

VIII AFSC from Col. J. A. Laird, Jr., 4 Oct. 1943.

38. Hq. 8th AF GO 211, 22 Nov. 1943.

39. CCS 387, 3 Nov. 1943; CM-IN-4198, Doolittle sgd. Eisenhower to Arnold for Spaatz, 7 Oct. 1943; La Marsa Conference (of American and British air officers), Oct. 1943.

40. CCS, 131st Mtg. (26 Nov. 1943), 135th Mtg. (5 Dec. 1943); CCS 387/3, 5 Dec. 1943.

41. CCS 138th Mtg., 7 Dec. 1943; CCS Msg. OZ 4046; Hq. AFHQ GO 67, 20 Dec. 1943.

42. Hq. AFHQ GO 67, 20 Dec. 1943; CM-OUT-8353, Marshall to Eisenhower and Royce, 22 Dec. 1943.

43. CCS 387/3, 5 Dec. 1943.

44. CM-OUT-7103, Arnold to Devers for Portal, 18 Dec. 1943; History, AFHQ, Pt. 3, Sec. 1, p. 652; CM-OUT-8843, Ulio to CG NATO, 22 Dec. 1943; Administrative History, 12th AF, Vol. I, Pt. III; CM-OUT-8490, Marshall to Eisenhower, 22 Dec. 1943; CM-OUT-10287, Marshall to Eisenhower, 28 Dec. 1943; CM-IN-14359, Spaatz to AGWAR for Arnold, 22 Dec. 1943; CM-IN-14751, Eisenhower to AGWAR, 23 Dec. 1943.

45. Robert E. Sherwood, "The Secret Papers of Harry L. Hopkins," in *Collier's*, 28 Aug. 1948, p. 75.

46. H. C. Butcher, *My Three Years with Eisenhower* (New York, 1946), p. 454.

47. CCS 138th Mtg., 7 Dec. 1943.

48. CCS 400/1, 26 Nov. 1943; CCS 400/2, 4 Dec. 1943; CCS 133d Mtg., 4 Dec. 1943.

49. CCS 138th Mtg., 7 Dec. 1943.

50. File 706.

51. *Ibid.*, 9 Dec. 1943.

52. CM-OUT-R7075, Arnold to Eaker, 18 Dec. 1943.

53. CM-IN-12181, Eaker to Arnold, 19 Dec. 1943.

54. Unnumbered msg., Spaatz to Arnold, 19 Dec. 1943.

55. CM-IN-W8720, Devers to Arnold, 20 Dec. 1943.

56. CM-OUT-5206, Arnold to Spaatz, 20 Dec. 1943; CM-OUT-7695, Arnold to Eaker, 20 Dec. 1943; File 706.

57. CM-OUT-R7248, Ulio to Eaker, 22 Dec. 1943; CM-OUT-5575, Ulio to Spaatz, 22 Dec. 1943.

58. CM-OUT-8843, Ulio to CG

NATO, 22 Dec. 1943; CM-OUT-8844, Ulio to CG ETO, 22 Dec. 1943; CM-OUT-10288, Marshall to Devers, 28 Dec. 1943; msg., AGWAR to ETOUSA and Algiers, 28 Dec. 1943, cited in History, MAAF, 10 Dec. 1942-1 Sept. 1944, Vol. II; History, AFHQ, Pt. 3, Sec. 1, p. 652.

59. History, MAAF, Vol. II; CM-IN-326, Adv. Hq. MAAF sgd. Eisenhower for AGWAR *et al.*, 31 Dec. 1943; CM-IN-13928, Air Comd. Post to Air Ministry *et al.*, 22 Dec. 1943; CM-IN-6374, Eisenhower to AGWAR, 10 Dec. 1943; History, AFHQ, Pt. 3, Sec. 1, pp. 652-53, 657; Organizational Memos 1 (1 Jan.), 3 (7 Jan. 1944), cited in History, MAAF, Vol. II; Administrative History, 12th AF, Pt. I; History, Original IX AFSC, p. 220; History, AAFSC/MTO, 1 Jan.-30 June 1944; History, XII AFSC; History, 15th AF (Rev.); Hq. AAF/MTO GO 1, 1 Jan. 1944; Adv. Directive, NATOUSA, 22 Dec. 1943.

60. Notes of Conference Held at La Marsa, North Africa, 24 Dec. 1943, in File 706.

61. File 706.

62. CM-IN-548, ETOUSA to AGWAR (Smith to WAR and Eisenhower), 1 Jan. 1944; notes, teletype conf. WD-TC-118, Spaatz and Giles, 4 Jan. 1944.

63. CM-OUT-1273 (JCS 71469), AGWAR to USFOR (Washington to London), 5 Jan. 1944; Hq. USSAFE GO 1, 6 Jan. 1944; Hq. 8th AF GO 6, 8 Jan. 1944.

64. Hq. ETOUSA GO 6, 18 Jan. 1944; Hq. USSAFE GO 6, 20 Jan. 1944.

65. Minutes, Hq. VIII AFSC Staff Mtg. 117, 7 Jan. 1944; notes on mtg., Hq. VIII AFSC, 9 Jan. 1944; Hq. USSTAF GO 12, 1 Mar. 1944.

66. ASC-USSTAF Organization Manual, 1 Mar. 1944.

67. Memo for Col. J. Preston from Maj. A. Lepawsky, 4 Mar. 1944; memo for Gen. Knerr from Preston, 2 June 1944.

68. USSTAF organization chart, 12 Feb. 1944; interview with Lt. Gen. Carl Spaatz by B. C. Hopper, 20 May 1945.

69. Hq. USSTAF GO 9, 12 Feb. 1944; ltr., Gen. Anderson to Brig. Gen. C. P. Cabell, Hq. USSTAF, 22 Apr. 1944; USSTAF organization chart, 12 Feb. 1944.

70. Hq. USSTAF organization charts, 21 Jan., 12 Feb. 1944; ASC-USSTAF organization manual, 1 Mar. 1944.

## APPENDIX



# TWELFTH AIR FORCE, 15 DECEMBER 1943

## XII AIR SUPPORT COMMAND

27 FB GP 324 F GP 64 F WG 57 B WG  
 3 SQ A-36 3 SQ P-40  
 86 FB GP 31 F GP 111 TR SQ 12 B GP 321 B GP 57 F GP  
 3 SQ A-36 3 SQ SPIT 1 SQ P-51 4 SQ B-25 4 SQ B-25 3 SQ P-40  
 33 F GP 47 B GP 340 B GP 79 F GP  
 3 SQ P-40 4 SQ A-20 4 SQ B-25 4 SQ P-40

## XII TRAINING COMMAND (PROV)

FTTR TR CTR BOMB TR CTR 19, 20, 22  
 3 SQ P-38, 39, 40 3 SQ B-17, 25, 26 REPL BNS

## XII AIR FORCE SERVICE COMMAND

I ASAC III ASAC

## XII FIGHTER COMMAND

62 F WG 63 F WG 480 AS GP 310 B GP  
 81 F GP 52 F GP 350 F GP 4 SQ B-25  
 3 SQ P-39 3 SQ SPIT 3 SQ P-39

## XII BOMBER COMMAND

RETAINING CADRE ONLY

## XII TROOP CARRIER COMMAND (PROV)

51 TC WG 52 TC WG  
 60 TC GP 64 TC GP 01 TC GP 314 TC GP  
 4 SQ C-47 & 53 4 SQ C-47 & 53 4 SQ C-47 & 53 4 SQ C-47 & 53  
 02 TC GP 313 TC GP 316 TC GP  
 4 SQ C-47 & 53 4 SQ C-47 & 53 4 SQ C-47 & 53

## 90 PHOTO RCN WING

3 PR GP 5 PR GP  
 2 SQ F-5A 2 SQ F-5A

# FIFTEENTH AIR FORCE, 15 DECEMBER 1943

## 5 BOMB WING

2 B GP 97 B GP 98 B GP 301 B GP 1 F GP 14 F GP 325 F GP  
 4 SQ B-17 4 SQ B-17 4 SQ B-17 3 SQ P-39 3 SQ P-38 3 SQ P-47

## 42 BOMB WING

17 B GP 319 B GP 320 B GP  
 4 SQ B-26 4 SQ B-26 4 SQ B-26

## 47 BOMB WING

98 B GP 376 B GP 82 F GP 68 T/R GP  
 4 SQ B-24 4 SQ B-24 3 SQ P-38 1 SQ B-17 & 25

## XV AIR FORCE SERVICE COMMAND

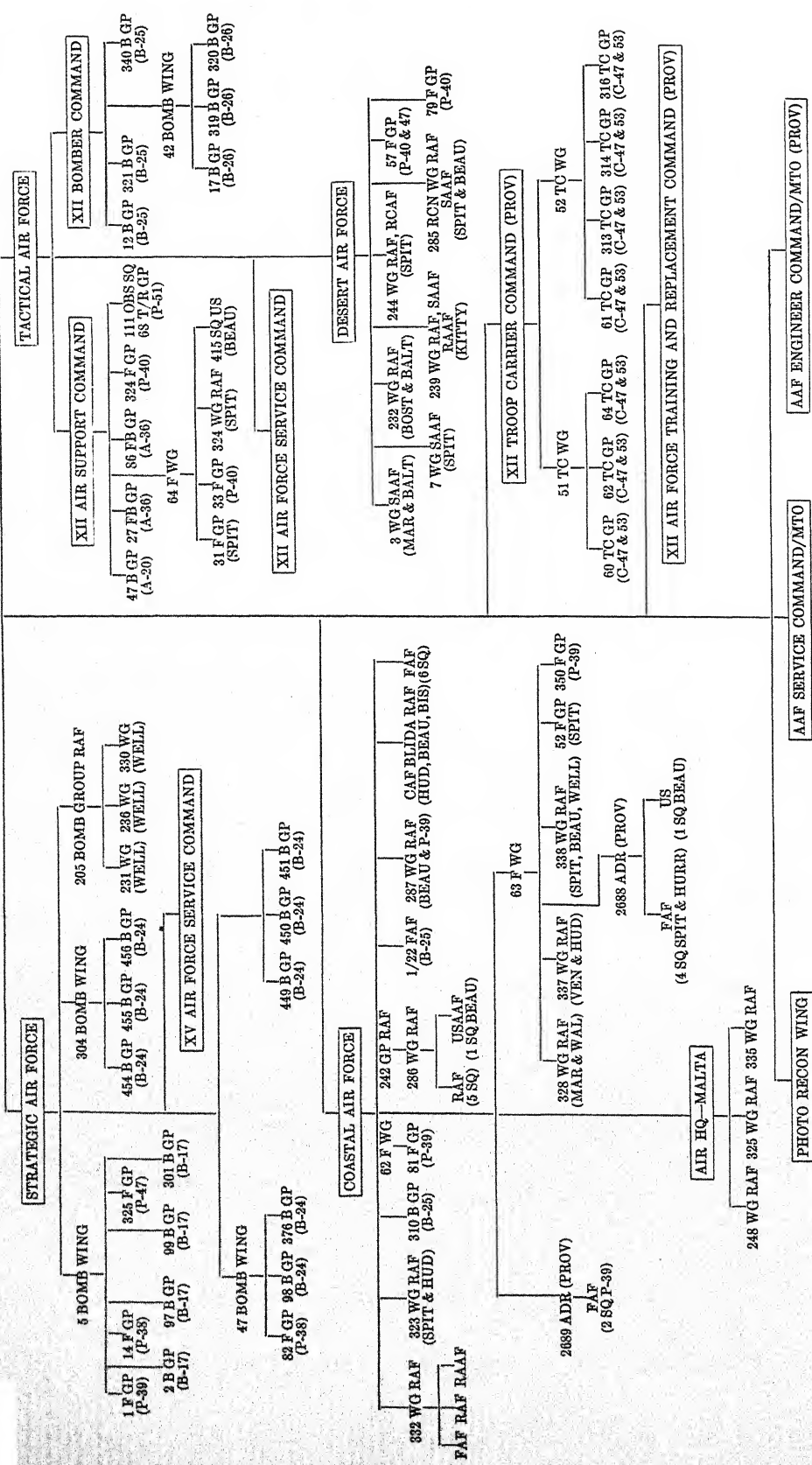
449 B GP 450 B GP 451 B GP  
 4 SQ B-24 4 SQ B-24 4 SQ B-24  
 SCHEDULED TO ARRIVE  
 BEFORE 31 DECEMBER

TO BE REASSIGNED TO TWELFTH AIR FORCE  
 (XII BOMBER COMMAND), 1 JANUARY 1944



# UNITS OF MEDITERRANEAN ALLIED AIR FORCES\*

1 JANUARY 1944  
OPERATIONAL CONTROL



\* All units are USAAF unless otherwise noted.

# EIGHTH AIR FORCE HEAVY BOMBER MISSIONS<sup>1</sup>

17 August 1942—31 December 1943

<i>No.*</i>	<i>Date</i>	<i>Target</i>	<i>Planes Dispatched</i>	<i>Planes Attacking</i>	<i>Losses</i>
	1942				
1.	17 Aug.	Rouen-Sotteville M/Y Diversion	12 6 <hr/> 18	12 <hr/> 12	
2.	19 Aug.	Abbeville/Drucat A/F	24	22	
3.	20 Aug.	Amiens-Longueau M/Y	12	11	
4.	21 Aug.	Rotterdam S/Y	12†		
5.	24 Aug.	Le Trait S/Y	12	12	
6.	27 Aug.	Rotterdam S/Y	9	7	
7.	28 Aug.	Meaulte I/A	14	11	
8.	29 Aug.	Courtrai/Wevelghem A/F	13	12	
9.	5 Sept.	Rouen-Sotteville M/Y	37	31	
10.	6 Sept.	Meaulte I/A	41	30	2
		St. Omer/Longuenesse A/F	13	11	
		St. Omer/Ft. Rouge A/F	<hr/> 2	<hr/> 2	
			54	43	2
11.	7 Sept.	Rotterdam S/Y	29	7	
		Utrecht, T/O	<hr/> 2	<hr/> 2	
			29	9	
12.	26 Sept.	Cherbourg/Maupertuis A/F	26(?)	†	
		Morlaix/Poujean A/F	19	†	
		Diversionary sweeps	30 <hr/> 75(?)	<hr/>	
13.	2 Oct.	Meaulte I/A	43	30	
		St. Omer/Longuenesse A/F	6	6	
		Diversionary sweep	13 <hr/> 62	<hr/> 36	

<sup>1</sup> See p. 852 for notes and symbols.

# THE ARMY AIR FORCES IN WORLD WAR II

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
14.	1942 9 Oct.	Lille I/T Courtrai/Wevelghem A/F St. Omer/Longuenesse A/F Roubaix, T/O Diversionary sweep	108    <u>7</u> 115	69 2 6 2 <u>—</u> 79	4    <u>—</u> 4
15.	21 Oct.	Lorient U/B Diversion-Cherbourg/ Maupertuis A/F	90  <u>17</u> 107	15  8 23	3  <u>—</u> 3
16.	7 Nov.	Brest U/B Diversionary sweep	68 <u>7</u> 75	34 <u>—</u> 34	   
17.	8 Nov.	Lille I/T Abbeville/Drucat A/F	38 <u>15</u> 53	30 11 41	1  <u>—</u> 1
18.	9 Nov.	St. Nazaire U/B	47	43	3
19.	14 Nov.	St. Nazaire U/B Diversionary sweep	34 <u>6</u> 40	24 <u>—</u> 24	   
20.	17 Nov.	St. Nazaire U/B Cherbourg/Maupertuis A/F Diversionary sweep	63 6 <u>10</u> 79	35 ‡ <u>—</u> 35	   
21.	18 Nov.	La Pallice U/B Lorient U/B St. Nazaire U/B, T/O Diversionary sweep	65   <u>26</u> 91	19 13 19 <u>—</u> 51	1   <u>—</u> 1
22.	22 Nov.	Lorient U/B	76	11	
23.	23 Nov.	St. Nazaire U/B	58	36	4
24.	6 Dec.	Abbeville/Drucat A/F Lille I/T Diversion	19 66 <u>18†</u> 103	6 36 <u>—</u> 42	1 1 <u>—</u> 2
25.	12 Dec.	Rouen-Sotteville M/Y Diversion-Abbeville/Drucat A/F	78  <u>12</u> 90	17  ‡ <u>—</u> 17	2  <u>—</u> 2

# APPENDIX

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
<i>1942</i>					
26.	20 Dec.	Romilly-sur-Seine A/F	101	72	6
27.	30 Dec.	Lorient U/B	77	40	3
<i>1943</i>					
28.	3 Jan.	St. Nazaire U/B	85	68	7
29.	13 Jan.	Lille I/T	72	64	3
		Diversion	16		
			88	64	3
30.	23 Jan.	Lorient P/A	90	35	5
		Brest U/B		18	
		Kerlin/Bastard A/F, T/O		1	
			90	54	5
31.	27 Jan.	Wilhelmshaven U/Y	91	53	3
		Emden U/B		2	
			91	55	3
32.	2 Feb.	Hamm M/Y	83	†	
33.	4 Feb.	Emden I/Area	86	39	5
34.	14 Feb.	Hamm M/Y	74	†	
35.	15 Feb.	Dunkirk, enemy raider	23	20	2
36.	16 Feb.	St. Nazaire U/B	89	65	8
37.	26 Feb.	Wilhelmshaven U/Y	93	63	7
		Enemy convoy		1	
			93	64	7
38.	27 Feb.	Brest U/B	78	60	
39.	4 March	Hamm M/Y	71	14	5
		Rotterdam S/Y		28	
		Diversionary sweep	14		
			85	42	5
40.	6 March	Lorient P/A	71	63	3
		Diversion-Brest U/B	15	15	
			86	78	3
41.	8 March	Rennes M/Y	67	54	2
		Rouen M/Y	16	13	2
			83	67	4
42.	12 March	Rouen-Sotteville M/Y	72	63	
		Diversionary sweep	18		
			90	63	

# THE ARMY AIR FORCES IN WORLD WAR II

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
43.	13 March	Amiens-Longueau M/Y	80	44	
		Abbeville/Drucat AF, T/O		8	
		Romescamps, T/O		21	
		Crevecoeur T/O		1	
		Diversionsary sweep	16		
			96	74	
44.	17 March	Rouen-Sotteville M/Y	78†		
		Diversionsary sweep	28		
			106		
45.	18 March	Vegesack U/Y	103	97	2
46.	22 March	Wilhelmshaven U/Y	102	84	3
47.	28 March	Rouen-Sotteville M/Y	103†	70	1
48.	31 March	Rotterdam S/Y	102	33	1
49.	4 April	Billancourt, Paris I/MT	97	85	4
		Diversionsary sweeps	26		
			123	85	4
50.	5 April	Antwerp I/A	104	82	4
51.	16 April	Lorient P/A	83	59	1
		Brest P/A	25	18	3
			108	77	4
52.	17 April	Bremen I/A	115	106	16
		T/O		1	
			115	107	16
53.	1 May	St. Nazaire U/B	78	25/31	7
		Diversionsary sweeps	24		
			102	25/31	7
54.	4 May	Antwerp I/MT	79	65	
		Diversionsary sweeps	33		
			112	65	
55.	13 May	Meaulte I/A	97	88	3
		St. Omer/Longuenesse A/F	72	31	1
			169	119	4
56.	14 May	Kiel S/Y	136	126	8
		Antwerp I/MT	45	38	1
		Courtrai A/F	43	34	2
			224	198	11

# APPENDIX

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
57.	15 May	Helgoland, Düne, and Wangerooge Island, T/O's	113	76	5
		Emden I/Areas	80	59	1
			193	135	6
58.	17 May	Lorient P/A and U/B	159	118	6
		Bordeaux U/B	39	34	1
			198	152	7
59.	19 May	Kiel U/Y	123	102	6
		Flensburg U/Y	64	56	
		Diversiónary sweep	24		
			211	158	6
60.	21 May	Wilhelmshaven U/Y	98	77	7
		Emden U/Y	63	46	5
			161	123	12
61.	29 May	St. Nazaire U/B	169	147	8
		La Pallice U/B	38	34	
		Rennes N/D	72	57	6
			279	238	14
62.	11 June	Wilhelmshaven U/Y	252	168	8
		Cuxhaven P/A, T/O		30	
		Other T/O's		20	
			252	218	8
63.	13 June	Bremen U/Y	152	102	26
		Kiel U/Y	76	44	
		T/O's		36	
			228	182	26
64.	15 June	Targets in Occupied France	155†		
65.	22 June	Hüls I/R	235	183	16
		Antwerp I/MT	42	39	4
		Diversiónary sweep	21		
			298	222	20
66.	23 June	Villacoublay	140†		
		Bernay/St. Martin A/F	40†		
			180†		



# THE ARMY AIR FORCES IN WORLD WAR II

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
67.	25 June	Convoys and T/O's in N.W. Germany	275	167	18
68.	26 June	Villacoublay I/A	246	12	5
		Poissy I/MT		5	
		Tricqueville A/F		39	
			246	56	5
69.	28 June	St. Nazaire P/A	191	158	8
		Beaumont-le-Roger A/F	50	43	
			241	201	8
70.	29 June	Le Mans I/A	232	74	
		T/O's in Northern France		2	
			232	76	
71.	4 July	Le Mans I/A	121	105	4
		Nantes I/A	71	61	3
		La Pallice U/B	83	71	1
			275	237	8
72.	10 July	Caen/Carpique A/F	286	34	3
		Abbeville/Drucat A/F		36	
			286	70	3
73.	14 July	Villacoublay I/A	116	101	3
		Le Bourget A/F	84	52	4
		Amiens A/F	64	53	1
			264	206	8
74.	17 July	Amsterdam I/A	332	21	1
		Industrial targets in N.W. Germany		34	1
			332	55	2
75.	24 July	Industrial targets in Heroya	309	167	1
		Trondheim U/Y		41	
			309	208	1
76.	25 July	Targets in Germany	323		19
		Hamburg U/Y		68	
		Kiel U/B		67	
		Rerik/West A/F		18	
		Heide		14	
		T/O's		51	
			323	218	19

## APPENDIX

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
77.	26 July	Targets in N.W. Germany	303		24
		Hamburg U/Y		54	
		Hannover I/R		92	
		Convoy		18	
		T/O's		35	
			303	199	24
78.	28 July	Kassel I/A	182	49	22
		Oschersleben I/A	120	28	
		T/O in N.W. Germany		18	
			302	95	22
79.	29 July	Targets in Germany	249		10
		Kiel U/Y		91	
		Warnemünde I/A		54	
		T/O's		48	
			249	193	10
80.	30 July	Kassel I/A (Bettenhausen)	119	94	12
		Kassel I/A (Waldau)	67	37	
		T/O's		3	
			186	134	12
81.	12 Aug.	Targets in the Ruhr	330	243	25
		Bochum			
		Bonn			
		Gelsenkirchen			
		Recklinghausen			
		T/O's			
82.	15 Aug.	GAF airfields in France and Holland	327		2
		Vlissingen (Flushing)		91	
		Poix and Amiens		56	
		Vitry		61	
		Merville and Lille/Vendeville		82	
			327	290	2
83.	16 Aug.	GAF air depots, France	246		4
		Le Bourget		169	
		Poix and Abbeville/Drucat			
		A/F		66	
		T/O's		2	
			246	237	4

# THE ARMY AIR FORCES IN WORLD WAR II

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
84.	17 Aug.	Schweinfurt I/T	230	183	36
		Frankfurt		1	
		T/O's		4	
		Regensburg I/A	146	127	24
			376	315	60
85.	19 Aug.	Gilze-Rijen and			
		Flushing A/F's	170	93	5
86.	24 Aug.	Villacoublay I/A	110	86	
		Conches and Evreux/			
		Fauville A/F's	42	22	1
		Bordeaux/Merignac A/F	85	58	3
		Diversionary sweep	36		
			273	166	4
87.	27 Aug.	Watten C/B	224	187	4
88.	31 Aug.	Amiens/Glisy A/F	319	106	3
89.	2 Sept.	Denain/Prouvy and			
		Mardyck A/F's	319	34	
90.	3 Sept.	Romilly-sur-Seine A/F	168	140	4
		Meulan-les-Mureaux I/A	65	56	
		Paris I/A	65	37	5
			298	233	9
91.	6 Sept.	T/O's in Germany and			
		France	338	262	45
		Diversionary sweep	69		
			407	262	45
92.	7 Sept.	Brussels I/A	114	105	
		Bergen/Alkmaar A/F and			
		convoy off Texel Is.	29	22	
		Watten C/B	147	58	
			290	185	
94.	9 Sept.	Paris I/A and Beaumont-			
		sur-Oise A/F	87	68	2
		Beauvais/Tillé A/F	63	59	
		Lille/Nord A/F	37	37	
		Lille/Vendeville A/F	56	52	
		St. Omer/Longuenesse A/F			
		and St. Omer/Ft. Rouge A/F	38	28	
		Abbeville/Drucat A/F	40	35	
		Vitry-en-Artois A/F	56	51	
			377	330	2

# APPENDIX

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
95.	15 Sept.	Romilly-sur-Seine A/F	93	87	
		Paris I/A	66	61	2
		Paris I/A and I/T	86	78	3
		Chartres A/F	63	47	1
			<u>308</u>	<u>273</u>	<u>6</u>
97.	16 Sept.	Nantes P/A and Nantes/ Château Bougon A/F	147	131	7
		La Pallice P/A and La Rochelle/Laleu A/F	105	72	4
		Cognac/Châteaubernard A/F	43	21	
			<u>295</u>	<u>224</u>	<u>11</u>
100.	23 Sept.	Nantes P/A	117	46	
		Vannes/Meucon A/F	67	55	
		Kerlin/Bastard A/F	63	53	1
			<u>247</u>	<u>154</u>	<u>1</u>
101.	23 Sept.	Nantes P/A and Rennes/ St. Jacques A/F	91	80	2
		Diversionary sweep	26		
			<u>117</u>	<u>80</u>	<u>2</u>
103.	26 Sept.	Targets in Northern France	202		
		Reims/Champagne A/F		40	
		Diversionary sweep	37		
			<u>239</u>	<u>40</u>	
104.	27 Sept.	Emden P/A and T/O's	305	244	7
		Diversionary sweep	24		
		Pathfinders	3	2	
			<u>332</u>	<u>246</u>	<u>7</u>
106.	2 Oct.	Emden I/Areas	347	337	2
		A/F in Holland	21		
		Pathfinders	2	2	
			<u>370</u>	<u>339</u>	<u>2</u>
108.	4 Oct.	Frankfurt I/Areas and Wiesbaden I/Areas	104	93	5
		Frankfurt city	51	37	3
		Saarlautern I/Areas and St. Dizier/Robinson A/F	115	105	4
		Saareguemines and Saarbrücken M/Y's	53	47	
		Diversionary sweep	38		4
			<u>361</u>	<u>282</u>	<u>16</u>

# THE ARMY AIR FORCES IN WORLD WAR II

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
111.	8 Oct.	Bremen I/Areas	174	158	13
		Vegesack U/Y	55	43	3
		Bremen city	170	156	14
			399	357	30
113.	9 Oct.	Anklam I/A	115	106	18
		Marienburg I/A	100	96	2
		Danzig-Gdynia U/Y and P/A	51	41	2
		Gdynia P/A	112	109	6
			378	352	28
114.	10 Oct.	Münster RR and WW	274	236	30
		Diversionary sweep	39		
			313	236	30
115.	14 Oct.	Schweinfurt I/T	291	229	60
		Diversionary sweep	29		
			320	229	60
116.	20 Oct.	Düren I/Areas	212	114	9
		Diversionary sweep	70		
			282	114	9
119.	3 Nov.	Wilhelmshaven P/A	555	528	7
		Pathfinders	11	11	
			566	539	7
121.	5 Nov.	Gelsenkirchen M/Y and oil plants	374	323	7
		Münster M/Y	118	104	3
		Pathfinders	11	9	
			503	436	10
124.	7 Nov.	Wesel I/Areas	59	53	
		Düren I/Areas	60	57	
		Pathfinders	3	2	
			122	112	
127.	11 Nov.	Münster M/Y	167	58	4
		Wesel	175	†	
		Pathfinders	5	1	
			347	59	4
130.	13 Nov.	Bremen P/A	268	115	9
		T/O's		25	7
		Pathfinders	4	3	
			272	143	16

# APPENDIX

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
131.	1943 16 Nov.	Rjukan I/Target	199	176	1
		Knaben I/Target	189	130	1
			<u>388</u>	<u>306</u>	<u>2</u>
132.	18 Nov.	Oslo/Kjeller A/F and Oslo I/A	102	82	9
134.	19 Nov.	T/O's in Western Germany	161	127	
		Pathfinders	6	3	
			<u>167</u>	<u>130</u>	
138.	26 Nov.	Bremen P/A	491	427	25
		Paris	128		4
		Pathfinders	14	13	
			<u>633</u>	<u>440</u>	<u>29</u>
140.	29 Nov.	Bremen P/A	360	154	13
143.	30 Nov.	Solingen I/Areas	378	78	3
		Pathfinders	3	1	
			<u>381</u>	<u>79</u>	<u>3</u>
145.	1 Dec.	Solingen I/Areas	293	275	24
		Pathfinders	6	6	
			<u>299</u>	<u>281</u>	<u>24</u>
149.	5 Dec.	Bordeaux/Merignac A/D	546	1	8
		Cognac/Châteaubernard A/D		2	1
		La Rochelle/Laleu A/D			
		St. Jean d'Angely A/D			
		Paris-Ivry			
		Paris-Bois de Colombes			
			<u>546</u>	<u>3</u>	<u>9</u>
151.	11 Dec.	Emden I/Areas	583	523	17
154.	13 Dec.	Bremen P/A	182	171	
		Kiel U/Y	516	466	5
		Hamburg P/A			
		Pathfinders			
			<u>12</u>	<u>12</u>	
			<u>710</u>	<u>649</u>	<u>5</u>
156.	16 Dec.	Bremen P/A	620	525	10
		Pathfinders	11	10	
			<u>631</u>	<u>535</u>	<u>10</u>
159.	20 Dec.	Bremen P/A	534	460	27
		Pathfinders	12	12	
			<u>546</u>	<u>472</u>	<u>27</u>



# THE ARMY AIR FORCES IN WORLD WAR II

No.*	Date	Target	Planes Dispatched	Planes Attacking	Losses
	1943				
161.	22 Dec.	Osnabrück M/Y	346	234	17
		Münster M/Y	225	199	5
		Pathfinders	8	6	
			579	439	22
164.	24 Dec.	Pas de Calais area C/B	722	670	
169.	30 Dec.	Ludwigshafen oil plant	698	647	23
		Pathfinders	12	11	
			710	658	23
171.	31 Dec.	Paris, Ivry, and Bois de Colombes	125	120	1
		Bordeaux/Marignac A/D and Cognac/Châteaubernard A/D	175	139	15
		Blockade runner	57		
		Cognac/Châteaubernard A/D	61	61	3
		St. Jean d'Angely A/D	94	87	1
		La Rochelle A/D	60	57	5
		Cognac/Châteaubernard A/D			
		Landes de Bussac A/D			
			572	464	25

\* Numbered missions omitted were small night operations, involving from 1 to 8 bombers, conducted for the purpose of dropping propaganda leaflets (30 missions), bombing with the RAF (8 missions), and testing equipment (7 missions). Principal sources of information for this table were the VIII Bomber Command Narrative of Operations, ORS Day Raid Reports, and Eighth Air Force mission reports.

† Planes recalled.

‡ Planes returned without bombing the target.

## SYMBOLS

A/D—Air depot	M/Y—Marshalling yard
A/F—Airfield	N/D—Naval storage depot
C/B—Crossbow targets	P/A—Port area
I/A—Industrial, aviation	RR—Railroads
I/Areas—Industrial areas	S/Y—Shipyards
I/MT—Industrial, motor transports	T/O—Target of opportunity
I/R—Industrial, rubber	U/B—U-boat base
I/T—Industrial, transportation	U/Y—U-boat yards
I/Target—Industrial target	WW—Waterways

## GLOSSARY



## GLOSSARY\*

\*   \*   \*   \*   \*   \*   \*   \*   \*   \*

AA	Antiaircraft
AAFAC	Army Air Forces Antisubmarine Command
AAFEC	Army Air Forces Engineer Command
AAFRH	Army Air Forces Reference History
AAFSAT	Army Air Forces School of Applied Tactics
AAFSC	Army Air Forces Service Command
AASC	Allied Air Support Command
A/B	Airborne
ABC	Air Base Command
ABFOR	American-British Forces
ACID Force	A British invasion force, Sicily
ADW	Air Defense Wing
AEAF	Allied Expeditionary Air Force
AFAAP	Asst. Chief of Air Staff, Personnel (A-1)
AFABI	Asst. Chief of Air Staff, Intelligence (A-2)
AFADS	Asst. Chief of Air Staff, Supply (A-4)
AFCC	Air Force Composite Command
AFCP	Allied Force Command Post
AFDIS	Intelligence Service
AFDMC	Management Control
AFDTS	Directorate of Technical Services
AFEC	Air Force Engineer Command
AFGIB	Air Forces General Information Bulletin
AFHQ	Allied Force Headquarters
AFIOP	Operational Division
AFOCR	Asst. Chief of Air Staff, Operations, Com- mitments, and Requirements
AFRAD	Directorate of Air Defense
AFREQ	Requirements Division

\* This glossary includes only terms not defined in the glossary of the preceding volume.

## THE ARMY AIR FORCES IN WORLD WAR II

AFRGS	Directorate of Ground-Air Support
AGD	Adjutant General's Department
AHB	Air Historical Branch (British Air Ministry)
AMC	Air Materiel Command
AMEW	Africa-Middle East Wing (ATC)
AMSME	American Military Mission, Middle East
A/P	Aircraft position
ARGUMENT	Coordinated attack by Eighth and Fifteenth Air Forces on German aircraft industries
AS	Antisubmarine
ASAC	Air Service Area Command
ASC	Air Support Command
ASCPFO	Air Service Command, Patterson Field, Ohio
ASC-USSTAF	Air Service Command, U.S. Strategic Air Forces in Europe
ASF	Army Service Forces
ASWORG	Antisubmarine Warfare Operations Re- search Group
ATG	Air Transport Group
AVALANCHE	Amphibious assault on Salerno, Sept. 1943
AVALANCHE Drop	Airborne mission to Naples area, Sept. 1943
BACKBONE	Project for possible invasion of Spanish Mo- rocco during early TORCH period
BACKBONE II	Revision of BACKBONE, Jan. 1943
BADA	Base Air Depot Area
BAM	British Air Ministry
BARK Force	A British invasion force, Sicily
BARRACUDA	Project for invasion in Naples area
BAYTOWN	British invasion of Italy near Reggio, Sept. 1943
BEW	Board of Economic Warfare
BLADE Force	British armored unit in TORCH operations
BLUIE	Greenland
BREASTPLATE	Project for landing at Sousse from Malta
BRIMSTONE	Project for invasion of Sardinia
BUTTRESS	Project for invasion of Calabria from North Africa, Sept. 1943

# GLOSSARY

CAF	Coastal Air Force
Cant.	Cantieri (Italian aircraft)
CBI	China-Burma-India
CBO	Combined Bomber Offensive
CCA	Combat Command A
Cdre.	Commodore
CENT Force	A U.S. invasion force, Sicily
CHESTNUT Nos. 1-4	Airborne missions in Sicilian campaign to harass enemy lines of communication
CINCUS	Commander in Chief, U.S. Fleet (later COMINCH)
CNO	Chief of Naval Operations
COA	Committee of Operations Analysts
COMNAVEU	Commander of U.S. Naval Forces in Europe
COPC	Combined Operational Planning Committee
CORKSCREW	Allied invasion of Pantelleria
COS	Chief of Staff (British)
COSSAC	Chief of Staff, Supreme Allied Commander
COURIER	German attack in central Tunisia, Jan. 1943
CP	Command post
CR-42	Fiat fighter biplane
CSW	Combat Support Wing
CTF	Center Task Force (in TORCH)
CVE	Aircraft carrier, escort
DAF	Desert Air Force
DATF	Desert Air Task Force
DC/AS	Deputy Chief of Air Staff
DDOP	Deputy Director of Organizational Planning (British)
DF	Direction finder
D.G.W.	Director General of Works (British)
DIME Force	A U.S. invasion force, Sicily
DMR	Directorate of Military Requirements
Do.	Dornier
D/S	Directorate of Supply
DZ	Drop zone



# THE ARMY AIR FORCES IN WORLD WAR II

EAC	Eastern Air Command
EBS	Eastern Base Section
ETF	Eastern Task Force (in TORCH)
FAF	French Air Force
FIREBRAND	Project for invasion of Corsica
FLAX	Attack on Axis air transport to Tunisia, March 1943
FM	Field Manual
FTS	Ferry and Transport Service
FUSTIAN	Airborne mission in invasion of Sicily
FW	Fighter Wing; Focke Wulf
GAF	German Air Force
GIANT I, III, IV	Airborne missions to Salerno area, Sept. 1943
GIANT II	Project for airborne mission to Rome area, Sept. 1943
GIBBON	Project for British landing at Taranto, Sept. 1943
GIBBON-SLAPSTICK	Project for British landing near Taranto, Sept. 1943
GOALPOST	U.S. subtask force in Casablanca invasion
GOBLET	Project for invasion of Italy near Crotone, Oct. 1943
GP	General purpose
GRT	Gross register tons
He	Heinkel
HE	High explosive
HMSO	His Majesty's Stationery Office
HOOVER	British landing in Italy north of Pizzo, Sept. 1943
HUSKY	Allied invasion of Sicily
HUSKY Nos. 1-2	Airborne missions to Gela, Sicily, July 1943
IAF	Italian Air Force
IAM	Italian Air Ministry
IG	Inspector General
IP	Initial point

# GLOSSARY

JCNW	Joint U.S. Committee on New Weapons and Equipment
JICA	Joint Intelligence Collection Agency
JOSS Force	A U.S. invasion force, Sicily
JPB-BLACK	Early U.S. plan for seizure of Dakar
Ju	Junkers
JUGGLER	Plan for coordinated air attack on aircraft plants at Regensburg and Wiener Neustadt
LADBROKE	Airborne mission to Syracuse area, July 1943
LCI	Landing craft, infantry
LCT	Landing craft, tank
LEO	Loire et Olivier
LG	Landing ground
LOC	Line of communications
LSI	Landing ship, infantry
LW	Light warning set
MAC	Mediterranean Air Command
MACAF	Mediterranean Allied Coastal Air Force
MAR	Maryland aircraft
MASAF	Mediterranean Allied Strategic Air Force
MATAF	Mediterranean Allied Tactical Air Force
MATS	Mediterranean Air Transport Service
MBS	Mediterranean Base Section
Mc	Macchi (Italian aircraft)
MCW	Moroccan Composite Wing
Me	Messerschmitt
ME	Middle East
MEIU	Middle East Interpretation Unit
MM&D	Materiel, Maintenance, and Distribution
MRU	Machine Records Unit
M/T	Motor transport
MTO	Mediterranean Theater of Operations
MUSKET	Project for invasion near Taranto
M/V	Merchant vessel
M/Y	Marshalling yard

# THE ARMY AIR FORCES IN WORLD WAR II

NAAF	Northwest African Air Forces
NAAFTCC	Northwest African Air Forces Troop Carrier Command
NAASC	Northwest African Air Service Command
NACAF	Northwest African Coastal Air Force
NAPRW	Northwest African Photographic Reconnaissance Wing
NASAF	Northwest African Strategic Air Force
NATAF	Northwest African Tactical Air Force
NATO	North African Theater of Operations
NATOUA	North African Theater of Operations, U.S. Army
NCXF	Naval Commander Expeditionary Force
NTF	Northern Task Force
NYPE	New York Port of Embarkation
OC&R	Operations, Commitments, and Requirements
OIC	Officer in charge
ORB	Operations Record Book
OSRD	Office of Scientific Research and Development
OSS	Office of Strategic Services
OVERLORD	Over-all plan for invasion of western Europe in 1944
PBY	Twin-engine U.S. Navy patrol bomber
PFF	Pathfinder force
POINTBLANK	Combined Bomber Offensive
PRU	Photographic Reconnaissance Unit
PRW	Photographic Reconnaissance Wing
P/W	Prisoner of War
QUADRANT	Quebec conference, Aug. 1943
RAFME	Royal Air Force, Middle East
RAFTC	Royal Air Force Transport Command
RCD	Replacement Control Depot
Rcn.	Reconnaissance

# GLOSSARY

RCT	Regimental Combat Team
RDF	Radio direction finder
Re	Reggiane
RM	Reichsmark
SAAF	South African Air Force
SAC	Service Area Command
SADA	Strategic Air Depot Area
SAF	Strategic Air Force
SASO	Senior Air Staff Officer
SATIN	Project for Allied drive to coast in southern Tunisia, Jan. 1943
SBD	Single-engine U.S. Navy scout bomber
SCU	Statistical Control Unit
SICKLE	Build-up of Eighth Air Force
S/Ldr.	Squadron Leader
SM	Savoia-Marchetti (Italian aircraft)
SOAPSUDS	Early name for plan to bomb Ploesti, Aug. 1943
SOP	Standard operating procedure
SOPAC	South Pacific
STARKEY	Combined air attack on Pas de Calais area, Aug.-Sept. 1943
STATESMAN	Plan superseded by SOAPSUDS
TADA	Tactical Air Depot Area
TAF	Tactical Air Force
TBF	Tactical Bomber Force
TC	Troop Carrier
TIDALWAVE	Bombing of Ploesti, Aug. 1943
T/O	Table of Organization
TOPHAT	Early plan for amphibious landing in Naples area, later called AVALANCHE
T/R	Tactical Reconnaissance
TRIDENT	Washington conference, May 1943
USAAFUK	U.S. Army Air Forces in United Kingdom
USAFIME	U.S. Army Forces in the Middle East
USAMEAF	U.S. Army Middle East Air Forces
USFET	U.S. Forces in European Theater

THE ARMY AIR FORCES IN WORLD WAR II

USSAFE	U.S. Strategic Air Forces in Europe
USSBS	U.S. Strategic Bombing Survey
USSTAF	U.S. Strategic Air Forces in Europe
VHF/RT	Very high frequency radio telephone
VLR	Very long range
VULCAN	Final Allied drive against Tunis and Bizerte, April-May 1943
WACW	Western Algerian Composite Wing
WDAF	Western Desert Air Force
WDCMC	War Department Classified Message Center
WOP	Allied drive from west in southern Tunisia, March-April 1943
WTF	Western Task Force (in TORCH)

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